

# THE 13TH INTERNATIONAL SYMPOSIUM ON MATHEMATICAL PROGRAMMING

CHUO UNIVERSITY, TOKYO, JAPAN



AUGUST 29 – SEPTEMBER 2, 1988

Final Announcement

July 1988

The Mathematical Programming Society  
The Operations Research Society of Japan

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The Mathematical Society of Japan  
The Society of Instrument and Control Engineers

This Symposium is supported by Japan World Exposition Commemorative Fund.

## **INVITATION**

This is the final announcement of the 13th International Symposium on Mathematical Programming on August 29 ~ September 2, 1988, at Chuo University, Tokyo, Japan.

It is our great pleasure to inform that we have received about 630 papers from 35 countries. The technical program will consist of two memorial lectures (in memory of Martin Beale and of L. V. Kantorovich), a plenary lecture, twelve tutorial-and-survey lectures, 85 specially organized sessions, and 91 contributed-paper sessions. We have especially emphasized and encouraged contributions of papers on applications of mathematical programming, and indeed have received more than 160 papers from a variety of fields such as finance, management, artificial intelligence, transportation, computational geometry, and various fields of engineering, which constitute a significant portion of the technical program.

We hope that many people from all over the world will participate in the Symposium; the success of the Symposium depends on you.

We are looking forward to seeing all of you very soon in Tokyo.

July 1, 1988

Organizing Committee

IRI Masao, Chairman  
KONNO Hiroshi, Vice-Chairman  
TONE Kaoru, Vice-Chairman

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Tone K. (Japan)

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Kobayashi T.	Oyama T.	Yamamoto Y.
Kojima M.	Ozawa M.	Yoshida M.
Manabe R.	Shinoda S.	

\* Chairman, Local Program Committee

## **GENERAL INFORMATION**

### **Location and Dates**

The Thirteenth International Symposium on Mathematical Programming will take place at the

**Kasuga (Korakuen) Campus of Chuo University**  
1-13-17 Kasuga-cho, Bunkyo-ku, Tokyo 112, Japan

on

August 29 (Monday) through September 2 (Friday), 1988.

The telephone number installed at the registration desk during this period is

03-811-8370.

Maps of the site are shown on pages 10 ~ 13.

### **Registration**

All participants, when they arrive at the conference site, must go to the registration desk to notify us of your presence and to pick up the symposium kit. The registration desk is located on the ground floor of **Building 6**, Chuo University, and open to both preregistered and nonregistered attendants according to the following schedule.

August 28, Sunday	14:00 ~ 20:00
August 29, Monday	08:30 ~ 19:00
August 30, Tuesday ~ September 1, Thursday	08:30 ~ 17:00
September 2, Friday	08:30 ~ 12:00

Please note that all participants, including speakers, session organizers and chairpersons, must register and pay the fee. The on-site registration fee is 29,000 yen for members of the Mathematical Programming Society or the Operations Research Society of Japan, and 35,000 yen for nonmembers. Payments will be accepted only in Japanese yen.

### **Refund Policy**

In case of cancellation, registrants are required to inform the Symposium Registration Office in writing. Full refunds will be made (less 5,000 yen handling fee) if cancellation letters are received prior to June 30, 1988. Half of the payment will be refunded if notices of cancellation are received between July 1 and July 31, 1988. No refunds can be made (but the symposium kit will be mailed) to registrants after August 1, 1988.

## **TRAVELLING TO JAPAN**

### **Visas**

Citizens of some countries need to hold a visa to enter Japan. Please consult your travel agent or the Japanese Consulate as to whether you need one or not. If a document from the Organizing Committee is necessary for you to obtain a visa, please write to Prof. KONNO Hiroshi, Vice-Chairman of the Organizing Committee (see page 9 for his address), as soon as possible as visa procedures are usually very slow.

### **Climate and Clothing**

Generally speaking, the climate of Tokyo at this time is hot and humid. The average temperature in late August is about 25°C (77°F). The average daily maximum and minimum temperatures are about 29°C (84°F) and 22°C (72°F), respectively. Participants are advised to wear light clothing, such as half-sleeve shirts. However, we recommend that you carry a light sweater or a jacket, as the symposium halls and hotels, and the main transportation systems in Tokyo are air-conditioned.

## **TRANSPORTATION**

### **From Tokyo International Airport (Narita) to Downtown Tokyo**

Tokyo International Airport at Narita is located about 60 kilometers east of the central Tokyo. Airport Limousine Buses run regularly between Narita Airport and the downtown Tokyo area, leaving the airport every 10 ~ 30 minutes in the daytime. They are bound for several busy centers in the metropolitan Tokyo area, such as TCAT (Tokyo City Air Terminal), Shinjuku, Tokyo Station, and Ikebukuro. Some of the buses also stop at major hotels on their way, but if no Limousine Bus stops at your hotel, we recommend that you take a bus bound for TCAT and then take a taxi from TCAT to your hotel.

It takes about 70 ~ 90 minutes and costs 2,500 ~ 3,000 yen from the airport to downtown Tokyo by Limousine Bus. (It will cost about 15,000 yen by taxi.) The taxi from TCAT to the symposium site will cost you around 2,000 yen.

### **From Osaka Airport to Tokyo**

If you arrive at Osaka Airport, you will have to take a domestic flight to Tokyo-Haneda Airport (not to Narita Airport), or go to Shin-Osaka Station by taxi and take the Shin-kansen (Bullet Train) to Tokyo Station. It takes about one hour from Osaka Airport to Tokyo-Haneda Airport by plane and three hours from Shin-Osaka to Tokyo by "Hikari" (Express) Shin-kansen. (A "Kodama" (Ordinary) Shin-kansen takes longer.)

## **Transportation in Tokyo**

Subways and JR (Japan Railway) trains are the most convenient means of transportation in Central Tokyo.

Central Tokyo is criss-crossed by a dense and complicated network of subway lines which connect the major centers, for example, Akasaka, Shinjuku, Shibuya, Ikebukuro, and Ueno. You can move between these centers on the subway for 120 ~ 140 yen.

The JR Yamanote Line circles Central Tokyo, and the JR Sobu-Chuo Line runs through Central Tokyo from east to west. Most of the major centers are also connected by these JR lines, and you can move from one place to another for 120 ~ 160 yen.

The Symposium Site, Kasuga Campus of Chuo University, is a 5-minute walk from Korakuen Station on the Marunouchi Line (subway), a 7-minute walk from Kasuga Station on the Mita Line (subway), and a 12-minute walk from Suidobashi Station on the JR Sobu Line.

## **TECHNICAL PRESENTATION**

### **Instructions for Speakers**

Thirty minutes (including 10 minutes for discussions) will be allocated to each invited and contributed paper. One hour will be allocated to the plenary, memorial, and tutorial-and-survey lectures. A blackboard and an overhead projector will be available. Presentations should be given in English.

### **Publications**

Abstracts of the papers will be printed in a booklet. The full texts of the tutorial-and-survey lectures will be published by Kluwer-Reidel. You will find both of these in the symposium kit.

In addition, Prof. W. R. Pulleyblank, the editor of *Mathematical Programming Series B*, has accepted the proposal of the Organizing Committee that he edits a special issue (or issues) consisting of excellent papers on Applications. These papers will be selected from among the ones presented at the Symposium, subject to the general refereeing procedure.

### **Software Demonstrations and Poster Sessions**

Two types of personal computers, IBM PS/2 (with 3.5-inch mini-floppy disk drives) and NEC PC-9801VM (with 5-inch mini-floppy disk drives), will be available for the demonstration of participants' noncommercial softwares. Participants who bring their own software (with appropriate OS to be prepared for themselves) in the form of

mini-floppy disks may use these computers.

A room will be prepared for posters. Participants who bring posters of their own papers can display them in this room.

## **Exhibits**

Several publishers and software vendors will exhibit recently published books and softwares on Mathematical Programming in the exhibit area near the symposium rooms.

# **SOCIAL EVENTS**

## **Welcoming Reception**

All participants and accompanying persons are invited to attend the Welcoming Reception which will start at 18:30, August 29 (Monday) at Suehiro in the basement of **Building 5** of Chuo University. The registration fee covers this expense.

## **Banquet**

A banquet will be held at Chinzan-so, one of the best restaurants in Tokyo with its famous Japanese garden, at 19:00, August 31 (Wednesday). The fee of the banquet is 10,000 yen per person. If you have already reserved a ticket in advance, you will receive it with your symposium kit. Tickets can also be purchased at the registration desk. Bus service is provided between the Symposium site and Chinzan-so Restaurant.

## **Spouse Program**

Explore Japanese traditional arts! Classes in Ikebana (flower arrangement) and Origami (the art of paper folding) conducted in English may be taken at the following times:

Ikebana: 14:00, August 31, Wednesday,  
Origami: 14:00, September 1, Thursday.

Both classes include practice and a demonstration by a professional instructor. Enrollments will be accepted at the registration desk on a first-come first-served basis, and are limited to 30 persons for each class. The fees are

Ikebana: 2,000 yen,  
Origami: 1,000 yen

which cover flowers for Ikebana or colored paper for Origami.

## DAILY LIFE IN TOKYO

### Expenses for Meals

The cost of meals spans a wide range, from inexpensive to very expensive. In general, Japanese restaurants present in their show windows samples of dishes together with their prices. Restaurants without such samples are usually very expensive. Restaurants in hotels are also relatively expensive. You can find less expensive restaurants in almost every part of Tokyo.

Many coffee shops have *morning-service* time, typically from 8:00 to 10:00, during which breakfast, for example, toast, an egg and salad with tea or coffee, is offered for 400 ~ 500 yen. Many restaurants have *lunch-service*, typically from 11:30 to 13:30 or 14:00, during which lunch is offered for 500 ~ 1,200 yen. At lunch-service time, restaurants of high rank also offer less expensive dishes, so that you can enjoy them at relatively low cost. The restaurant in Chuo University, where the Symposium takes place, also offers lunches for around 500 yen.

For dinner there is no special *service time*. You can usually have dinner for 800 ~ 2,000 yen.

Dishes at the above prices can be found without special effort. Those who want to save more can find very competitive fast food shops with hamburgers, fried chicken, and pizzas.

### RELEVANT ADDRESSES AND PHONE NUMBERS

Registration desk at the Symposium site

Telephone: 03-811-8370

August 28, Sunday, 14:00 ~ 20:00

August 29, Monday, 8:30 ~ 19:00

August 30, Tuesday ~ September 1, Thursday, 8:30 ~ 17:00

September 2, Friday, 8:30 ~ 12:00

Organizing Committee

Organizing Committee for the 13th International Symposium  
on Mathematical Programming  
c/o The Operations Research Society of Japan  
Gakkai-Center Bldg.  
2-4-16 Yayoi, Bunkyo-ku  
Tokyo 113, Japan

## **Local Program Committee**

**Local Program Committee for the 13th International Symposium  
on Mathematical Programming**  
c/o The Institute of Statistical Mathematics  
4-6-7 Minami-Azabu, Minato-ku  
Tokyo 106, Japan  
Fax: 03-446-1695

## **For Symposium advance registration**

**13th International Symposium on Mathematical Programming  
Registration Office**  
c/o International Communications, Inc.  
Kasho Bldg., 2-14-9 Nihombashi, Chuo-ku  
Tokyo 103, Japan  
Telephone: 03-272-7981  
Telex: 2223585 ICS J  
Fax: 03-273-2445

## **Official travel agent**

**Japan Travel Bureau, Inc.  
Foreign Tourist Division  
Convention Center (Ref. CD 8-7201-88)  
1-13-1 Nihombashi, Chuo-ku  
Tokyo 103, Japan  
Telephone: 03-276-7885  
Telex: 24418 TOURIST J  
Fax: 03-271-4134**

## **For other information**

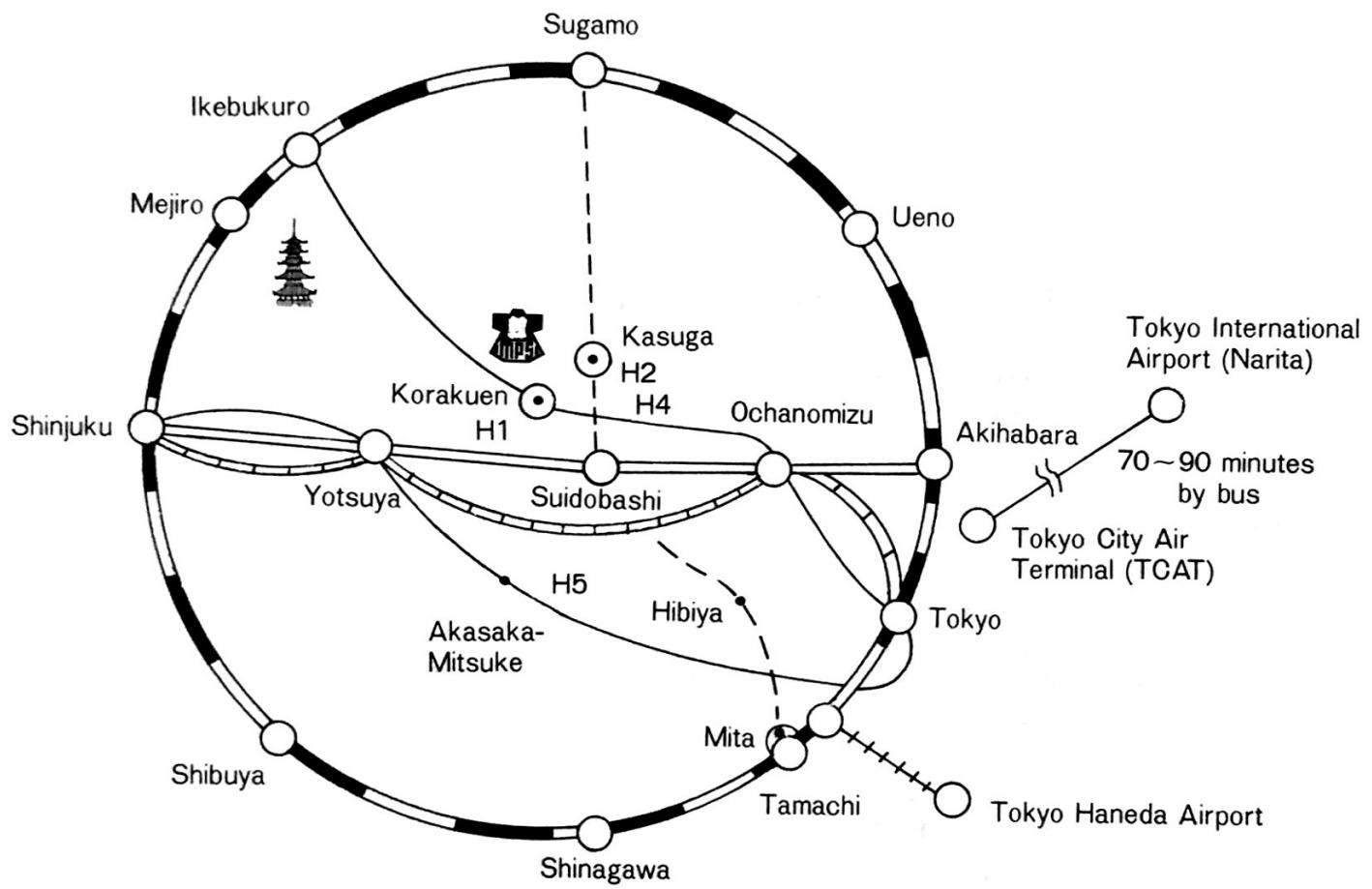
**Professor KONNO Hiroshi  
Institute of Human and Social Sciences (Jinsha)  
Tokyo Institute of Technology  
Oh-Okayama, Meguro-ku  
Tokyo 152, Japan  
Telephone: 03-726-1111 ext. 2371  
Fax: 03-748-2075**

## **Banquet hall**

**Chinzan-so Restaurant  
2-10-8 Sekiguchi, Bunkyo-ku  
Tokyo 112, Japan  
Telephone: 03-943-1111**

# Maps

## Transportation in Central Tokyo



— JR Yamanote Line

— JR Sobu Line

— JR Chuo Line

+++++ Tokyo Monorail

— Marunouchi Line (subway)

— Mita Line (subway)

(There are many other subway lines)



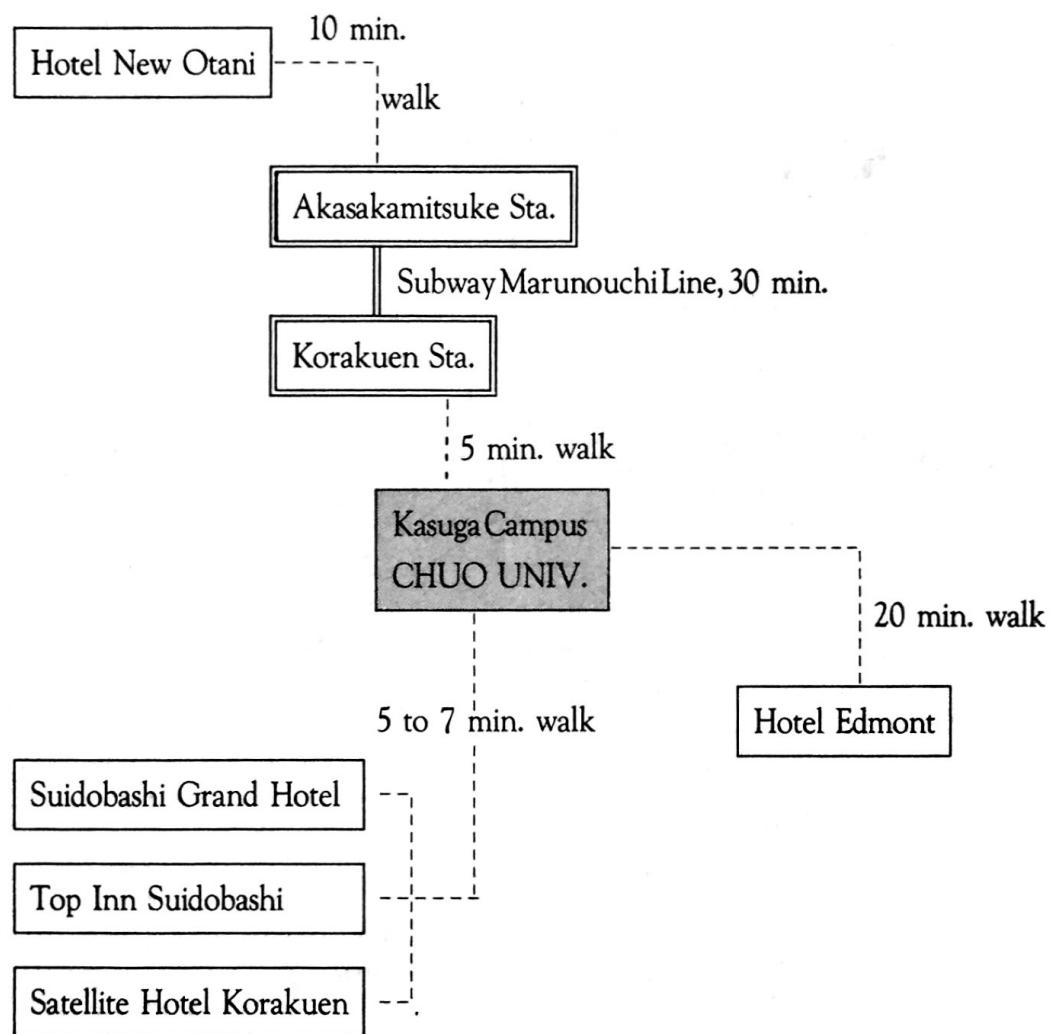
Symposium Site (Chuo University)



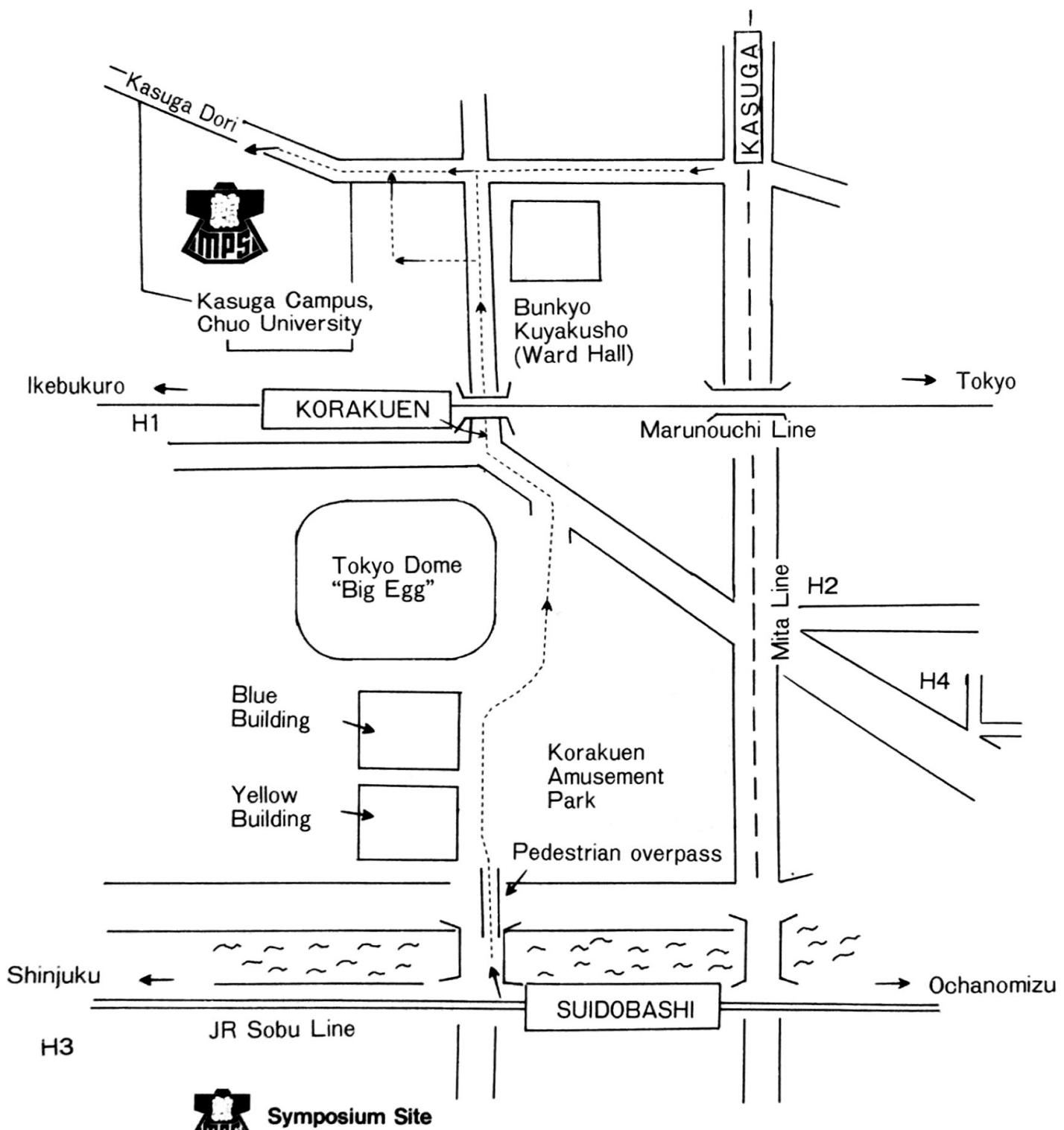
Banquet Hall (Chinzan-so)

H1 : Satellite Hotel Korakuen, H2 : Suidobashi Grand Hotel,  
H3 : Hotel Edmont, H4 : Top Inn Suidobashi, H5 : Hotel New Otani

## From Hotels to the Symposium Site



## From Neighboring Stations to the Symposium Site



5 minute walk from KORAKUEN Station, Marunouchi Line.

7 minute walk from KASUGA Station, Mita Line.

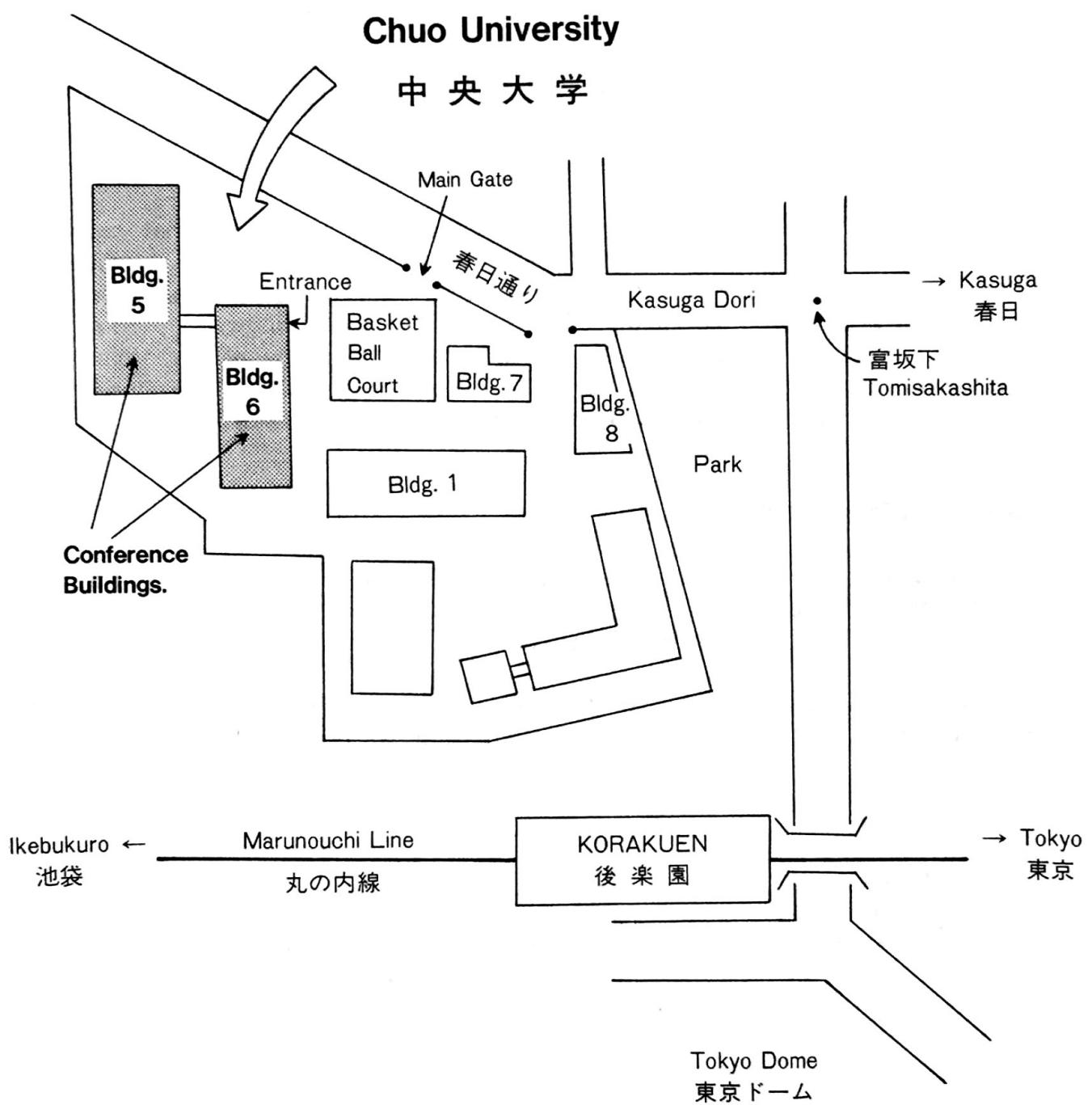
12 minute walk from SUIDOBASHI Station, JR Sobu Line.

H1 : Satellite Hotel Korakuen, H2 : Suidobashi Grand Hotel

H3 : Hotel Edmont,

H4 : Top Inn Suidobashi

# Kasuga Campus, Chuo University



## TECHNICAL PROGRAM

### Daily Schedule

A day of the Symposium has four time slots, which are separated by breaks and lunch.

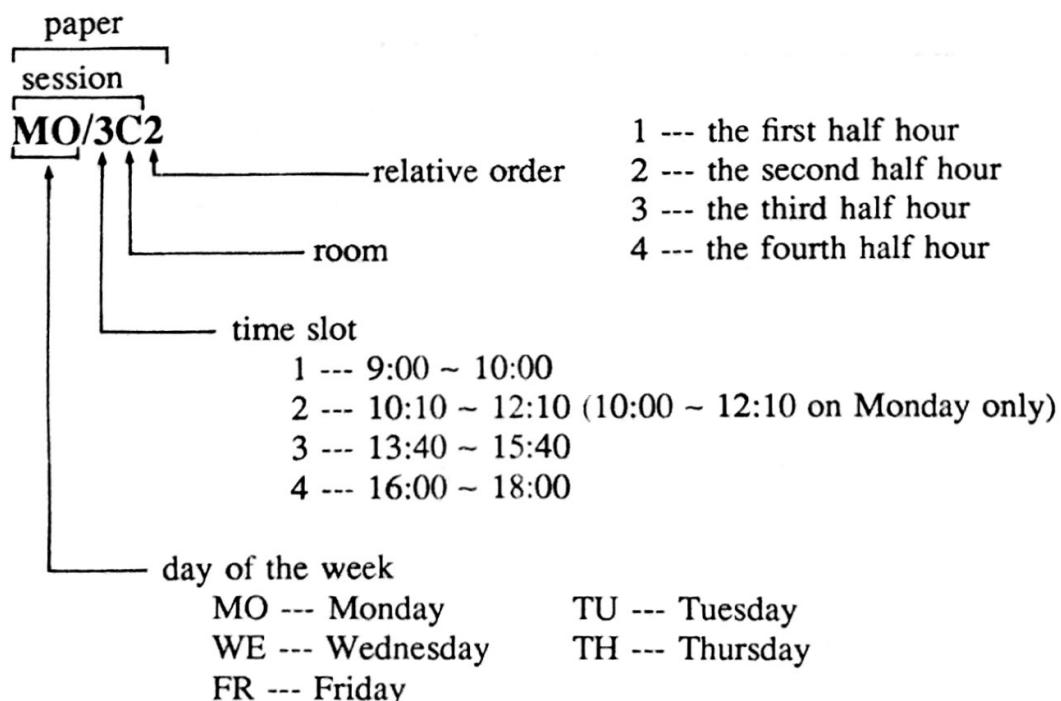
Time Slot 1	9:00 ~ 10:00
Time Slot 2	10:10 ~ 12:10 (10:00 ~ 12:10 on Monday only)
Time Slot 3	13:40 ~ 15:40
Time Slot 4	16:00 ~ 18:00

The program is classified into specially organized sessions, memorial sessions, contributed-paper sessions, memorial lectures, a plenary lecture, and tutorial-and-survey lectures. Each of specially organized sessions and contributed-paper sessions typically consists of four 20-minute talks each of which is followed by 10-minute discussion. About twelve sessions are held in parallel; in general they are placed in Time Slots 2 and 4, but some are placed in Time Slots 1 and 3. The tutorial-and-survey lectures will be held with at most two in parallel in Time Slot 1 or 3.

### Session and Paper Codes

Every **session** is coded by four alpha-numeric letters separated by slant. The first two capital letters indicate the day of the week, the next numeral indicates the time slot in the day, and the last capital letter indicates the room in which the session is held.

Each **paper** (or presentation) is identified by the session code plus one numeral (or numerals) indicating the relative order in each session, where a numeral corresponds to half an hour.



## Acknowledgments

About 630 invited and contributed papers are scheduled in the following technical program. The twelve tutorial-and-survey lectures, two memorial sessions, 85 specially organized sessions and 91 contributed paper sessions will run in parallel in total 15 time slots except for the two memorial lectures and the plenary lecture. The specially organized sessions are marked by \* at the end of the session titles in the program. The invited papers are marked also by \* at the end of their titles. The Local Program Committee would like to thank the organizers of specially organized sessions, whose names are listed under the titles of the sessions, for their great efforts in materializing such an attractive program.

## Time Table

Date Time slot	Monday August 29	Tuesday August 30
9:00 { 10:00		Tutorial-and-Survey & Parallel Sessions TU/1
10:00 { 10:10	Opening Session & Plenary Lecture	
10:10 { 12:10	MO/2	Parallel Sessions TU/2
12:10 { 13:40		
13:40 { 15:40	Tutorial-and-Survey & Parallel Sessions MO/3	Tutorial-and-Survey & Parallel Sessions TU/3
15:40 { 16:00		
16:00 { 18:00	Parallel Sessions MO/4	Parallel Sessions TU/4
	18:30 { 21:00 Welcoming Reception	18:15 Business Meeting of COAL

	Wednesday August 31	Thursday September 1	Friday September 2
	Martin Beale Memorial Lecture  WE/1	L.V. Kantorovich Memorial Lecture  TH/1	Tutorial-and-Survey & Parallel Sessions  FR/1
Break			
	Parallel Sessions (including Memorial Session)  WE/2	Parallel Sessions (including Memorial Session)  TH/2	Parallel Sessions  FR/2
Lunch			
	Tutorial-and-Survey & Parallel Sessions  WE/3	Tutorial-and-Survey & Parallel Sessions  TH/3	Parallel Sessions  FR/3
Break			
	Parallel Sessions  WE/4	Parallel Sessions  TH/4	General Assembly  FR/4
	19:00 Banquet 21:00		



# **Program**



**Monday, August 29**

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**MO/2A**  
**Opening Session**

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**MO/2A1&2 10:00-11:00**

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**MO/2A**  
**Plenary Lecture**

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**MO/2A3&4 Todd, Michael J., USA**  
Recent Development and Future Trend in Linear Programming\*

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**MO/3A**  
**Tutorial-and-Survey Lecture I**

---

**MO/3A1&2 Magnanti, Thomas L., USA**  
Mathematical Programming and Network Design\*

---

**MO/3A3&4 Florian, M., Canada**  
Mathematical Programming Applications in National, Regional and Urban Planning\*

---

**MO/3B**  
**Interior Point Methods in Linear Programming I\***

---

Organizer and Chairperson: **Goldfarb, D., USA**

**MO/3B1 Lagarias, J. C., USA**  
**Bayer, D. A., USA**  
Karmarkar's Linear Programming Algorithm and Newton's Method\*

**MO/3B2 Marsten, Roy, USA**  
**Saltzman, Matthew, USA**  
**Shanno, David F., USA**  
A Dual Affine Interior Point Algorithm for Linear Programs with Bounded Variables\*

**MO/3B3 Mehrotra, Sanjay, USA**  
**Sun, Jie, USA**  
An Algorithm for Convex Quadratic Programming that Requires  $O(n^{3.5}L)$  Arithmetic Operations\*

**Monday, August 29**

**MO/3B4 McShane, K., USA**

**Monma, Clyde L., USA**

**Shanno, David F., USA**

Computational Experience with a Primal-Dual Interior Point Method for Linear Programming\*

---

**MO/3C**

**Nonlinear Optimization I**

---

**MO/3C1 Yuan, Ya-xiang, United Kingdom**

A Dual Algorithm for Minimizing a Quadratic Function with Two Quadratic Constraints

**MO/3C2 Du, Ding-Zhu, China**

**Zhang, Xiang-Sun, China**

Proof Techniques for the Global Convergence of Feasible Direction Methods\*

**MO/3C3 Wu, Fang, China**

**Wu, Shi-quan, China**

A Modified Frank-Wolfe Algorithm and its Convergence Properties\*

**MO/3C4 Bi, Zhi-yong, Canada**

**Calamai, Paul H., Canada**

A Second-Order Method for Discrete  $L_p$  Approximations

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**MO/3D**

**Parallel Computing in Mathematical Programming I\***

---

Organizer and Chairperson: **Dennis, J. E., Jr., USA**

**MO/3D1 Meyer, Robert R., USA**

Parallel Optimization of Nonlinear Networks\*

**MO/3D2 Nash, Stephen G., USA**

**Sofer, Ariela, USA**

Block Truncated-Newton Methods for Parallel Optimization

**MO/3D3 Dennis, J. E., Jr., USA**

**Torczon, Virginia, USA**

Parallel Variants of the Nelder-Mead Simplex Algorithm\*

---

**MO/3E**

**Linear Complementarity Problems I\***

---

Organizer and Chairperson: **Pang, Jong-Shi, USA**

**Monday, August 29**

**MO/3E1 Saigal, Romesh, USA**

Interior Methods for the Linear Complementarity Problem\*

**MO/3E2 Cottle, Richard W., USA**

**Pang, Jong-Shi, USA**

**Venkateswaran, V., USA**

Sufficient Matrices and the Linear Complementarity Problem\*

**MO/3E3 Kojima, Masakazu, Japan**

**Mizuno, Shinji, Japan**

**Yoshise, Akiko, Japan**

Centers and Circumscribed Ellipsoids that Contain All Solutions of a Positive Semi-definite Linear Complementarity Problem\*

**MO/3E4 Gowda, M. S., USA**

Pseudomonotone Linear Complementarity Problems\*

---

**MO/3F**

**Multi-Objective Programming: Optimizing and Satisficing Approach\***

---

Coorganizers: **Shimizu, Kiyotaka, Japan**

**Lootsma, Freerk Auke, Netherlands**

Chairperson: **Shimizu, Kiyotaka, Japan**

**MO/3F1 Nakayama, Hirotaka, Japan**

Recent Results of Satisficing Trade-off Method\*

**MO/3F2 Shimizu, Kiyotaka, Japan**

**Tanaka, Nobuaki, Japan**

**Lu, Min, Japan**

Interactive Satisficing and Optimizing Method for Multi-Objective Decision Problem\*

**MO/3F3 Ishizuka, Yo, Japan**

Optimality Conditions for Multi-Objective Optimization Problems Including Extremal-value Functions\*

**MO/3F4 Gal, Tomas, FRG**

**Wolf, Karin, FRG**

Sensitivity Analysis in Linear Vectormaximum Problems - The Preference Cone Changing Approach\*

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**MO/3G**

**The Travelling Salesman Problem: New Polyhedral Theory\***

---

Organizer and Chairperson: **Grötschel, Martin, FRG**

**Monday, August 29**

- MO/3G1** **Boyd, Sylvia C.**, Canada  
**Cunningham, William H.**, Canada  
Small Symmetric Travelling Salesman Polytopes\*
- MO/3G2** **Cornuéjols, Gérard**, USA  
**Harche, Farid**, USA  
Polyhedral Study of the Capacitated Vehicle Routing Problem\*
- MO/3G3** **Naddef, Denis**, France  
The Symmetric Travelling Salesman Polytope via the Graphical Relaxation: A Survey\*
- MO/3G4** **Fonlupt, Jean**, France  
**Nachez, Armand**, France  
Composition of Graphs and Constraints for the Graphical Travelling Salesman Problem\*
- 

## **MO/3H** **Scheduling I**

---

- MO/3H1** **Kawaguchi, Tsuyoshi**, Japan  
**Kyan, Seiki**, Japan  
**Ebara, Hiroyuki**, Japan  
**Nakano, Hideo**, Japan  
**Nakanishi, Yoshiro**, Japan  
Scheduling Jobs with Release Times to Minimize Schedule Length
- MO/3H2** **Neumann, Klaus**, FRG  
Stochastic Single-Machine Scheduling to Minimize the Maximum Expected Lateness Subject to OR Network Precedence Constraints
- MO/3H3** **Nishikawa, Yoshikazu**, Japan  
**Tamaki, Hisashi**, Japan  
**Deno, Tohru**, Japan  
A Study on Decomposition Method for Jobshop Scheduling
- MO/3H4** **Serafini, Paolo**, Italy  
**Ukovitch, Walter**, Italy  
A Mathematical Model for Periodic Scheduling Problems
- 

## **MO/3I** **Combinatorial Optimization I**

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- MO/3I1** **Katoh, Naoki**, Japan  
An  $\varepsilon$ -Approximation Scheme for Minimum Variance Combinatorial Problems

**Monday, August 29**

- MO/3I2** **Hadley, S.**, Canada  
**Rendl, F.**, Canada  
**Wolkowicz, H.**, Canada  
Application of Parametric Programming and Eigenvalue Maximization to the Quadratic Assignment Problem
- MO/3I3** **Robinson, A. G.**, USA  
**Goldman, A. J.**, USA  
On an Optimization Problem Associated with the Set Coincidence Game
- MO/3I4** **Connolly, David**, United Kingdom  
Combinatorial Optimization Using Simulated Annealing
- 

**MO/3J**  
**Global Optimization\***

Organizer and Chairperson: **Rosen, J. B.**, USA

- MO/3J1** **Al-Khayyal, Faiz A.**, USA  
Global Optimization of Mixed-Integer Quadratic Programs\*
- MO/3J2** **Horst, Reiner**, FRG  
**Benson, Harold**, USA  
**van Thaoi, Nguyen**, Vietnam  
A New Conical Algorithm for Concave Minimization Problems\*
- MO/3J3** **Pardalos, Panos M.**, USA  
**Rodgers, Gregory P.**, USA  
Computational Results of Parallel Branch and Bound Algorithms for Quadratic Integer Programming on Several Supercomputer Architectures\*
- MO/3J4** **Fujiwara, Okitsugu**, Thailand  
**Khang, Do Ba**, Thailand  
Optimal Design of Looped Water Distribution Networks via Concave Minimization\*
- 

**MO/3K**  
**Artificial Intelligence and Heuristic Optimization\***

Organizer and Chairperson: **Glover, Fred**, USA

- MO/3K1** **de Werra, Dominique**, Switzerland  
**Hertz, Alain**, Switzerland  
**Bovet, Jean**, Switzerland  
**Constantin, Caroline**, Switzerland  
Tabu Search for Coloring and Scheduling Problems\*

Monday, August 29

- MO/3K2 Matsuo, Hirofumi, USA**  
**Suh, Chang Juck, USA**  
**Sullivan, Robert S., USA**  
A Controlled Search Simulated Annealing Method for Job Scheduling\*

- MO/3K3 Hertz, Alain, Switzerland**  
**de Werra, Dominique, Switzerland**  
**Widmer, Marino, Switzerland**  
Some New Applications of Tabu Search\*

- MO/3K4 Glover, Fred, USA**  
**Knox, John, USA**  
**Thompson, Gerald, USA**  
Heuristic Analysis and Tabu Search for Travelling Salesman Problems\*

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**MO/3L**  
**Data Envelopment Analysis I\***

---

Organizer and Chairperson: **Charnes, Abraham, USA**

- MO/3L1 Sojka, Jozef, Czechoslovakia**  
Dynamic Aspects of Data Envelopment Analysis\*

- MO/3L2 Sengupta, Jati K., USA**  
The Influence Curve Approach in Data Envelopment Analysis\*

- MO/3L3 Wei, Q. L., China**  
**Charnes, Abraham, USA**  
**Cooper, W. W., USA**  
**Huang, Z., USA**  
Cone Ratio Data Envelopment Analysis and Multi-Objective Programming\*

- MO/3L4 Seiford, Lawrence M., USA**  
Data Envelopment Analysis: A State-of-the-Art Survey\*

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**MO/3N**  
**Applied Game Theory I\***

---

Organizer and Chairperson: **Muto, Shigeo, Japan**

- MO/3N1 Dragan, Irinel, USA**  
The Modified Bargaining Set of a Cooperative  $N$ -Person Game: The Existence Problem\*

- MO/3N2 Young, Peyton, USA**  
Cost Allocation and Demand Revelation\*

Monday, August 29

**MO/3N3 Driessen, Theo, Netherlands**

**Funaki, Yukihiko, Japan**

Coincidence of the Prenucleolus and the Egalitarian Nonseparable Contribution Method\*

**MO/3N4 Funaki, Yukihiko, Japan**

**Driessen, Theo, Netherlands**

Linearity Between Several Solutions for Certain Classes of Games\*

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## **MO/3O**

### **Mathematical Programming in Steel Industry\***

Organizer: **Takenaka, Toshio, Japan**

Chairperson: **Tokuyama, Hiroyuki, Japan**

**MO/3O1 Fukumura, Satoshi, Japan**

**Sanou, Katsuaki, Japan**

**Yamakawa, Eiki, Japan**

An Application of Expert System to Shipment-planning\*

**MO/3O2 Kohno, Yoshinobu, Japan**

**Iizuka, Kazuo, Japan**

**Yamaguchi, Harutoshi, Japan**

Improvement of Hungarian-Method for Automatic Transportation Control System\*

**MO/3O3 Tripathy, A., India**

Mathematical Programming Application in Integrated Steel Plants\*

**MO/3O4 Ueno, Nobuyuki, Japan**

**Nakagawa, Yoshiyuki, Japan**

**Katagi, Yasuo, Japan**

**Inui, Akira, Japan**

New Production & Material Flow Control System in Steel Works -Practical Solution of Multi-item Scheduling Problem\*

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## **MO/3P**

### **Mathematical Programming Modelling and Knowledge Representation Methods\***

Organizer and Chairperson: **Mitra, Gautam, United Kingdom**

**MO/3P1 Mckinnon, K. I. M., United Kingdom**

**Williams, H. P., United Kingdom**

Constructing Integer Programming Models by the Predicate Calculus\*

Monday, August 29

MO/3P2 **Bisshop, J. J.**, Netherlands  
**Kuip, C. A. C.**, Netherlands

A Functional Description of Integrated Modeling Software for Mathematical Programming\*

MO/3P3 **Bisshop, J. J.**, Netherlands  
**Kuip, C. A. C.**, Netherlands

Set Operations in the Description of Mathematical Programs\*

MO/3P4 **Fourer, Robert**, USA  
**Gay, David M.**, USA

**Kernighan, Brian W.**, USA

Extensions to AMPL, a Modeling Language for Mathematical Programming\*

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## MO/4B

### Interior Point Methods in Linear Programming II\*

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Organizer and Chairperson: **Megiddo, Nimrod**, USA

MO/4B1 **Vaidya, Pravin M.**, USA

Linear Programming and the Analytical Center of a Polytope\*

MO/4B2 **Kojima, Masakazu**, Japan

**Mizuno, Shinji**, Japan

**Yoshise, Akiko**, Japan

A Polynomial-Time Algorithm for a Class of Linear Complementarity Problems\*

MO/4B3 **Megiddo, Nimrod**, USA

An Interior Point Potential Reduction Algorithm for the Linear Complementarity Problem\*

MO/4B4 **Gonzaga, Clovis**, Brazil

Bi-Directional Search Procedures in Interior Point Methods for Linear Programming\*

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## MO/4C

### Large Scale Nonlinear Programming\*

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Organizer and Chairperson: **Toint, Ph. L.**, Belgium

MO/4C1 **Griewank, Andreas**, USA

Convergence Properties of Classical and Partitioned Secant Methods on Classes of Large Problems\*

MO/4C2 **Dembo, Ron S.**, Canada

**Henaff, Patrick**, USA

Towards the Solution of Very Large Nonlinearly-Constrained Optimization Models\*

**Monday, August 29**

**MO/4C3 Conn, A. R., Canada**

**Gould, Nick I. M., United Kingdom**

**Toint, Ph. L., Belgium**

A Globally Convergent Augmented Lagrangian Method for Large-Scale Nonlinear Programming\*

**MO/4C4 Kelley, Tim, USA**

Mesh Independence Results for Sequential Quadratic Programming in Hilbert Spaces\*

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## **MO/4D**

### **Numerical Linear Algebra in Optimization**

---

**MO/4D1 Gill, Philip E., USA**

**Murray, Walter, USA**

**Saunders, Michael A., USA**

Numerical Optimization on High-Performance Computers

**MO/4D2 Pierra, Guy, France**

**Ottavy, Noël, France**

New Parallel Projection Methods for Linear Varieties and Applications

**MO/4D3 Maculan, Nelson, Filho, Brazil**

**de Paula, Geraldo Galdino, Jr., Brazil**

A Linear-Time Median-Finding Algorithm for Projecting a Vector on the Simplex of  $R^n$

**MO/4D4 Pyle, L. Duane, USA**

On the Use of Orthogonal Projections in the Solution of Mathematical Programming and Linear Systems Problems

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## **MO/4E**

### **Linear Complementarity Problems II\***

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Organizer and Chairperson: **Pang, Jong-Shi, USA**

**MO/4E1 Mangasarian, Olvi L., USA**

Least-Norm Solution of Complementarity Problems

**MO/4E2 Eaves, B. Curtis, USA**

**Freund, Robert, USA**

Computing Flex Points in a Polytope with Lemke's Algorithm

**MO/4E3 Chandrasekaran, R., USA**

Ellipsoidal Methods for LCP and Stochastic Games

**Monday, August 29**

- MO/4E4 Shiau, Tzong-Huei, USA**  
Complementarity Theory for Diagonally Dominant Matrices
- 

**MO/4F**  
**Optimal Control I\***

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Organizer and Chairperson: **Polak, Elijah, USA**

- MO/4F1 de O Pantoja, J. F. A., United Kingdom**  
**Mayne, D. Q., United Kingdom**  
A Sequential Quadratic Programming Algorithm for Discrete Optimal Control Problems with Control Inequality Constraints\*

- MO/4F2 Rockafellar, R. T., USA**  
**Wets, Roger J-B, USA**  
Generalized Linear-Quadratic Problems of Deterministic and Stochastic Optimal Control in Discrete-Time\*

- MO/4F3 Baker, Theodore, USA**  
**Polak, Elijah, USA**  
An Optimal Control Algorithm for Slewing Flexible Structures Subject to Control and State Space Constraints\*

- MO/4F4 Garliauskas, Algis, USSR**  
Dynamic Optimization of Large-Scale Networks
- 

**MO/4G**  
**The Travelling Salesman Problem: Very Large Scale\***

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Organizer: **Grötschel, Martin, FRG**  
Chairperson: **Padberg, Manfred W., USA**

- MO/4G1 Johnson, David S., USA**  
**McGeoch, Lyle A., USA**  
**Rothberg, Edward E., USA**  
Near-Optimal Solutions to Very Large Traveling Salesman Problems\*

- MO/4G2 Padberg, Manfred W., USA**  
**Rinaldi, Giovanni, Italy**  
Resolution of Large Symmetric Traveling Salesman Problems\*
- 

**MO/4H**  
**Scheduling II**

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**Monday, August 29**

**MO/4H1** **Chang, Shiwei**, China  
**Tang, Guochun**, China

Worst Case Behaviour of Local Neighborhood Search Algorithms for the Total Weighted Tardiness Problem

**MO/4H2** **Sharma, Prabha**, India

Variance Minimization of Flow Time in Single Machine Sequencing is a Linear Assignment Problem

**MO/4H3** **Posner, Marc E.**, USA

Scheduling on a Hypercube\*

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## **MO/4I**

### **Combinatorial Optimization II**

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**MO/4I1** **Bortot, Paolo**, Italy

**Sorato, Annamaria**, Italy

A Class of K-Bottleneck Problems - A Unified Approach

**MO/4I2** **Nakagawa, Yuji**, Japan

**Rardin, Ronald L.**, USA

Modular Algorithm for Hierarchically Structured Knapsack Problems

**MO/4I3** **Johnston, Robert**, Australia

Reducing Cardinality in Linear Programmed Cutting Stock Solutions

**MO/4I4** **Ribeiro, Celso**, Brazil

**Minoux, Michel**, France

**Penna, Camilo**, Brazil

A Combined Branch-and-Bound/Column-Generation Approach for Some Very Large Scale Set Partitioning Problems with Special Structure

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## **MO/4J**

### **Nonconvex Programming I\***

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Coorganizers: **Horst, Reiner**, FRG

**Tuy, Hoang**, Vietnam

Chairperson: **Horst, Reiner**, FRG

**MO/4J1** **Tuy, Hoang**, Vietnam

Recent Advances in Constrained Global Optimization (Survey)\*

**MO/4J2** **Horst, Reiner**, FRG

Deterministic Global Optimization with Partition Sets Whose Feasibility is Not Known\*

**Monday, August 29**

**MO/4J3 Pardalos, Panos M., USA**

On the Global Minimization of the Product of Two Linear Functions over a Polytope\*

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**MO/4K**

**Artificial Intelligence and Applications\***

---

Organizer and Chairperson: **Whinston, Andrew B., USA**

**MO/4K1 Holsapple, Clyde W., USA**

**Whinston, Andrew B., USA**

Building User Interfaces for Model Management\*

**MO/4K2 Balakrishnan, Anantaram, USA**

**Moore, James C., USA**

**Whinston, Andrew B., USA**

**Pakath, Ramakrishnan, USA**

A Knowledge-Based Approach to Model Specification\*

**MO/4K3 Jeroslow, Robert G., USA**

**Wang, Jinchang, USA**

Integral Polyhedra and Horn Clause Knowledge Bases\*

**MO/4K4 Greenberg, Harvey J., USA**

Neural Networks and Heuristic Search\*

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**MO/4L**

**Data Envelopment Analysis II\***

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Coorganizers: **Phillips, Fred Y., USA**

**Golany, Boaz, Israel**

**Charnes, Abraham, USA**

Chairperson: **Phillips, Fred Y., USA**

**MO/4L1 Sueyoshi, Toshiyuki, USA**

Data Envelopment Analysis Review of AT&T Breakup\*

**MO/4L2 Lewin, Arie Y., USA**

Applications of DEA to Research on Organization Effectiveness and Design : Learning from Outliers\*

**MO/4L3 Golany, Boaz, Israel**

**Phillips, Fred Y., USA**

**Rousseau, John J., USA**

A DEA-Based Approach to Productivity Analysis\*

Monday, August 29

**MO/4L4 Karney, Dennis F., USA**

**Kleinsorge, Ilene, USA**

Incorporation Quality Considerations into the Decision Making Process of a Nursing Home Chain\*

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**MO/4M**

## **Mathematical Programming in Economic Planning**

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**MO/4M1 Imai, Yoshio, Japan**

**Suzuki, Shigemichi, Japan**

A Measure Transformation Method for Nonlinear Programming and its Applications to Economic Problems

**MO/4M2 Wang, Yuji, China**

**Liu, Haihua, China**

The Turnpike Model: An Application to the Regional Economic Planning

**MO/4M3 Qi, Yinfeng, China**

A 0-1 Programming Model for Dynamic Market Planning

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**MO/4N**

## **Game Theory I**

---

**MO/4N1 Gambarelli, Gianfranco, Italy**

Survival Game: A Dynamic Approach to  $N$ -person Bargaining

**MO/4N2 Kuhn, Harold W., USA**

Extensive Form Revisited

**MO/4N3 Tamir, Arie, USA**

On the Core of Network Design Cost Allocation Games

**MO/4N4 Syed, Sabbir Ahmed, Japan**

The General Separable Cost Allocation and the Airport Landing Fees

---

**MO/4O**

## **Mathematical Programming in Chemical Engineering\***

---

Organizer and Chairperson: **Shikakura, Hisao, Japan**

**MO/4O1 Konno, Hiroshi, Japan**

**Sekino, Hiroaki, Japan**

Optimizing Chemical Plant Operation by Mixed Integer Programming\*

Monday, August 29

- MO/4O2** **Nishitani, Hirokazu, Japan**  
**Shimizu, Kouji, Japan**  
**Kunugita, Eiichi, Japan**  
Optimal Design of Chemical Plant with a Large Number of Uncertain Parameters\*
- MO/4O3** **Hashizume, Satoru, Japan**  
Scheduling Composite Job-Shop Models by Priority Dispatching\*
- 

**MO/4P**

**Recent Developments of Languages and Tools for Mathematical Programming Modelling\***

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Organizer: **Mitra, Gautam, United Kingdom**

Chairperson: **Fourer, R., USA**

- MO/4P1** **Greenberg, Harvey J., USA**  
An Overview of Intelligent Mathematical Programming Systems\*

- MO/4P2** **Mitra, Gautam, United Kingdom**  
Tools for Modelling Support and Construction of Optimization Applications\*

- MO/4P3** **Schrage, Linus, USA**  
**Cunningham, Kevin, USA**  
An Optimization Modeling Language for PC's\*

- MO/4P4** **Lucas, C., United Kingdom**  
Design Objectives and User Aspects of CAMPS: Computer Assisted Mathematical Programming (Modelling) System\*

**Tuesday, August 30**

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**TU/1A**

**Tutorial-and-Survey Lecture II**

---

**TU/1A1&2** **Griewank, Andreas, USA**  
Automatic Differentiation\*

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**TU/1B**

**Interior Point Methods in Linear Programming III\***

---

Organizer and Chairperson: **Tone, Kaoru, Japan**

**TU/1B1** **Yamashita, Hiroshi, Japan**  
**Arakawa, Takamichi, Japan**  
Projective Newton Method for Linear Programming\*

**TU/1B2** **Yi, Shang, China**

A New Polynomial Time Algorithm for Linear Programming Based on Direct Saddle Point Convergence\*

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**TU/1C**

**Unconstrained Nonlinear Optimization I\***

---

Organizer and Chairperson: **Spedicato, Emilio, Italy**

**TU/1C1** **Wedin, Per-Åke, Sweden**  
A Geometrical Approach to Nonlinear Least Squares Computations\*

**TU/1C2** **Grippo, Luigi, Italy**

**Lampariello, Francesco, Italy**

**Lucidi, Stefano, Italy**

Nonmonotone Stabilization Methods for Newton-type Algorithms in Unconstrained Optimization\*

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**TU/1D**

**Implementation and Evaluation of Optimization Algorithms I**

---

**TU/1D1** **Kao, Chiang, China**

A Nonlinear Programming Expert System

**TU/1D2** **Orlin, James B., USA**

**Ahuja, Ravi K., USA**

**Kodialam, Murali, USA**

A New Framework for Testing Algorithms

**Tuesday, August 30**

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## **TU/1F Optimal Control II**

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**TU/1F1** **Futagami, Tanehiro, Japan**

Dynamic Linear Programming Coupled with the Boundary Element Method for  
Optimal Control of Transient Distributed Parameter Systems

**TU/1F2** **Iwamoto, Seiichi, Japan**

Sequential Minimax Control Processes on  $R^p$

---

## **TU/1G Probabilistic Analysis of Algorithms\***

---

Organizer: **Rinnooy Kan, Alexander H. G., Netherlands**

Chairperson: **Borgwardt, Karl Heinz, FRG**

**TU/1G1** **Borgwardt, Karl Heinz, FRG**

Average Behaviour of Some Optimization Algorithms\*

**TU/1G2** **Rhee, Wanwoo T., USA**

Stochastic Analysis of the Quadratic Assignment Problem\*

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## **TU/1I Network Algorithms I**

---

**TU/1I1** **Nishihara, Osamu, Japan**

**Kumamoto, Hiromitsu, Japan**

**Inoue, Koichi, Japan**

An Algorithm for a Multiple Cut Problem and its Application

**TU/1I2** **Balsamo, S., Italy**

**Bertossi, A. A., Italy**

**Donatiello, L., Italy**

On the Average Time Complexity of Dijkstra's Shortest Path Algorithm

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## **TU/1M Mathematical Programming in Management I**

---

**TU/1M1** **Talpaz, Hovav, Israel**

**Hurwitz, Shmuel, Israel**

**de la Torre, Jose R., USA**

**Sharpe, Peter J. H., USA**

Optimization of Growth Trajectory for Broilers

Tuesday, August 30

**TU/1M2 Wee, Moses H. M., China**

**Pan, C. Y., China**

Inventory Management for  $N$ -Items Under Budget Constraint and Varying Return-on-Investment\*

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## **TU/1N**

### **Game Theory II**

---

**TU/1N1 Granot, Daniel, Canada**

**Granot, Frieda, Canada**

On Some Network Flow Games\*

**TU/1N2 Peters, Hans, Netherlands**

**van Damme, Eric, FRG**

Characterizing Nash and Other Bargaining Solutions by Disagreement Point Axioms

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## **TU/1P**

### **Mathematical Programming Modeling Tools and Systems I**

---

**TU/1P1 Rahnavard, Parvin, USA**

An Automated System for Nonlinear Optimization Problem Integrated with Relational Database

**TU/1P2 Vlach, Milan, Czechoslovakia**

Aggregation in Linear and Convex Programming\*

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## **TU/2B**

### **Interior Point Algorithms in Optimization\***

---

Organizer and Chairperson: **Karmarkar, Narendra K., USA**

**TU/2B1 Karmarkar, Narendra K., USA**

Riemannian Geometry Underlying Interior-Point Algorithm for Linear Programming\*

**TU/2B2 Karmarkar, Narendra K., USA**

**Ramakrishnan, K. G., USA**

Implementation and Computational Results of the Karmarkar Algorithm for Linear Programming, Using an Iterative Method for Computing Projections\*

**TU/2B3 Karmarkar, Narendra K., USA**

An Interior-Point Approach to NP-Complete Problems\*

**Tuesday, August 30**

**TU/2B4 Karmarkar, Narendra K., USA**

**Resende, Mauricio G. C., USA**

Preliminary Computational Testing of Karmarkar's Method for Integer Programming\*

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## **TU/2D**

### **Implementation and Evaluation of Optimization Algorithms II**

---

**TU/2D1 Kobayashi, Yasuhiro, Japan**

**Tamura, Masayoshi, Japan**

**Shigematsu, Yoichi, Japan**

Performance Evaluation of Quadratic Programming Solvers for Constrained Non-linear Optimization

**TU/2D2 Tamura, Masayoshi, Japan**

**Kobayashi, Yasuhiro, Japan**

Application of Sequential Quadratic Programming to Actual Problem

**TU/2D3 Mahdavi-Amiri, Nezam, Canada**

Nonlinearly Constrained Nonlinear Programming: An Exact Penalty Approach with Projected Hessian Updates

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## **TU/2E**

### **Solving Equations with Homotopies\***

---

Organizer and Chairperson: **Eaves, B. Curtis, USA**

**TU/2E1 Dirven, Lianne, Netherlands**

**Talman, Dolf, Netherlands**

Simplicial Algorithms to Compute Equilibria in an Economy with Linear Production Technologies\*

**TU/2E2 Wang, Zeke, China**

A Geometrical Interpretation of the Without-Exception Feasibility of PL Homotopy Methods\*

**TU/2E3 Kojima, Masakazu, Japan**

**Mizuno, Shinji, Japan**

**Noma, Toshihito, Japan**

A New Continuation Method for Complementarity Problems with Uniform P-Functions\*

**TU/2E4 Li, T. Y., USA**

**Rhee, N., USA**

Homotopy Algorithm for Symmetric Eigenvalue Problems\*

**Tuesday, August 30**

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## **TU/2F Optimal Control III**

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**TU/2F1** **Qiu, Changtao,** China

**Fu, Guang,** China

Optimization Design of LOC by Optimizing both Weighting Matrices and Output Feedbacks\*

**TU/2F2** **Asano, Takao,** Japan

**Suzuki, Shigemichi,** Japan

**Yoshikawa, Kazuhiro,** Japan

A Network-Theoretic Approach to the Design of a Precompensator for Multivariable Adaptive Control

**TU/2F3** **Ichikawa, Akira,** Japan

Optimal Control for Linear Systems with Overtaking and Average Criteria

**TU/2F4** **Maruyama, Yukihiko,** Japan

Second-Order Necessary Conditions for an Optimal Control Problem with State Constraints

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## **TU/2G**

### **Mixed Integer Programming Representability\***

Organizer and Chairperson: **Jeroslow, Robert G., USA**

**TU/2G1** **Rardin, Ronald L., USA**

**Sudit, Moises,** USA

Local Search in a Canonical Paroid Formulation for Combinatorial Optimization\*

**TU/2G2** **Wolsey, Laurence A., Belgium**

Formulation and Resolution of Single and Multi-Level, Multi-Item Lot-Sizing Problems by Mixed Integer Programming\*

**TU/2G3** **Vande Vate, John,** USA

Stable Sets and Stable Marriages\*

**TU/2G4** **Brezovec, Carl,** USA

**Cornuéjols, Gérard,** USA

**Glover, Fred,** USA

A Matroid Algorithm with Applications to Traveling Salesman Problems\*

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## **TU/2H**

### **Theory and Algorithms for Location Problems**

---

**Tuesday, August 30**

**TU/2H1 Oliveira, Manuel, Portugal**

A Network Design Model for the Facilities Location Problem

**TU/2H2 Shiode, Shogo, Japan**

A Geometrical Algorithm for Minimax Facility Location Problems on a Sphere

**TU/2H3 Koshizuka, Takeshi, Japan**

**Kurita, Osamu, Japan**

Approximated Formulas of Average Distances Associated with Regions and Their Applications to Location Problems

**TU/2H4 de Paula, Geraldo Galdino, Jr., Brazil**

**Maculan, Nelson, Filho, Brazil**

A p-Median Location Algorithm Based on the Convex Lagrangian Relaxation of the Benders' Master Problem

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**TU/2I**

**Network Algorithms II**

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**TU/2I1 Olin, Birgitta, Sweden**

**Lindberg, Per Olov, Sweden**

On Random Assignment Problems

**TU/2I2 Matsui, Tomomi, Japan**

**Saruwatari, Yasufumi, Japan**

**Hirabayashi, Ryuichi, Japan**

A Root-Relaxation Algorithm for the Minimum-Cost Perfect Matching Problems

**TU/2I3 Ahuja, Ravi K., USA**

**Orlin, James B., USA**

Faster Primal Simplex Algorithms for the Shortest Path and Assignment Problems

**TU/2I4 Frank, Marguerite, USA**

Link-Addition Paradox and Link-Deletion Algorithm in Network User-Optimization

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**TU/2J**

**Nonconvex Programming II\***

---

Coorganizers: **Tuy, Hoang, Vietnam**

**Horst, Reiner, FRG**

Chairperson: **Tuy, Hoang, Vietnam**

**TU/2J1 Tuy, Hoang, Vietnam**

**Al-Khayyal, Faiz A., USA**

Concave Minimization by Piecewise Affine Underestimation\*

**Tuesday, August 30**

**TU/2J2 Ben Saad, Sihem, USA**

**Jacobsen, Stephen E., USA**

A Conical Reduction Algorithm for Reverse Convex Optimization\*

**TU/2J3 Thach, Phan Thi n, Vietnam**

A New Partitioning Method for a Class of Nonconvex Optimization Problems

**TU/2J4 Thach, Phan Thi n, Vietnam**

Methods for Finding a Globally Optimal Solution of the Design Centering Problem

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## **TU/2L**

### **Mathematical Programming in Medicine I\***

Organizer and Chairperson: **Kawashiro, Takeo, Japan**

**TU/2L1 Nakamura, Masahiko, Japan**

Maximum Entropy Component Recovery : Application to Radionuclide Angiography\*

**TU/2L2 Kawashiro, Takeo, Japan**

**Yamasawa, Fumihiro, Japan**

**Okada, Yasumasa, Japan**

**Kobayashi, Hirosuke, Japan**

**Tanabe, Kunio, Japan**

Uneven Distribution of Blood Flow to Ventilation-Perfusion Ratios in Lungs Estimated by a Modified Newton Method\*

**TU/2L3 Ochiai, Chikayuki, Japan**

**Ueda, Yasuichi, Japan**

**Kimura, Kazumoto, Japan**

**Nagai, Masakatsu, Japan**

Clinical Application of Mathematical Programming to Cerebral Blood Flow Measurement\*

**TU/2L4 Tabushi, Katsuyoshi, Japan**

**Itoh, Susumu, Japan**

**Sakura, Mizuyoshi, Japan**

**Kutsutani-Nakamura, Yuzuru, Japan**

**Iinuma, Takeshi A., Japan**

**Arai, Tatsuo, Japan**

An Optimal Irradiation Condition for Intracavitary Radiotherapy Using Quadratic Programming\*

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## **TU/2M**

### **Mathematical Programming in Management II**

**Tuesday, August 30**

**TU/2M1 van de Panne, Cornelis, Canada**

A Simulation of Decentralization in a Linear Programming Refinery Model

**TU/2M2 Welscheid, Manfred, FRG**

'Oscillating' Behaviour of Parameters in Multi-Stage Models and Their Iterative Treatment

**TU/2M3 Yoshida, Minoru, Japan**

A Sensitivity Analysis for a Production Smoothing Problem with Linear Inventory Holding Costs

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**TU/2N**

**Applied Game Theory II\***

Organizer and Chairperson: **Charnes, Abraham, USA**

**TU/2N1 Charnes, Abraham, USA**

Huang, Z., USA

Rousseau, John J., USA

Wei, Q. L., China

Cone-Extremal Solutions of Multi-Payoff Games with Cross-Constrained Strategy Sets\*

**TU/2N2 Sakaguchi, Minoru, Japan**

The Value of Sample Information in La Relance Poker\*

**TU/2N3 Shapley, Lloyd S., USA**

Multi-Person Utility Theory\*

---

**TU/2O**

**Mathematical Programming Applications to Electric Power Systems I\***

Coorganizers: **Toyoda, Junichi, Japan**

Sekine, Yasuji, Japan

Chairperson: **Toyoda, Junichi, Japan**

**TU/2O1 Uchida, Naoyuki, Japan**

Nagao, Taiji, Japan

A Method for Steady State Stability Analysis of Large Power Systems and an Application to Dynamic Security Control\*

**TU/2O2 Song, Kil-Young, Korea**

Hong, Sang-Eun, Korea

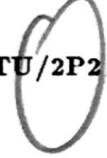
The Optimal Economic Operation of Hydroreservoir System\*

**Tuesday, August 30**

- TU/2O3** **Aoki, Kenichi**, Japan  
**Itoh, Masaru**, Japan  
**Satoh, Taiji**, Japan  
**Nara, Koichi**, Japan  
Lagrangian Relaxation and Variable Metric Method for Power Generation Scheduling Problem\*
- TU/2O4** **Nishiya, Ken-ichi**, Japan  
**Yasuda, Keiichiro**, Japan  
**Hasegawa, Jun**, Japan  
Optimal Scheduling in Hydrothermal Power Systems Based on the Lagrangian Relaxation\*
- 

**TU/2P**  
**Mathematical Programming Modeling Tools and Systems II**

---

- TU/2P1** **Ciriani, Tito A.**, Italy  
Interactive Approaches in the Optimization Cycle of Large Models
- TU/2P2**  **Ciriani, Tito A.**, Italy  
**Flamini, Renzo**, Italy  
**Glozzi, Stefano**, Italy  
A Matrix Editor for Large Optimization Models
- TU/2P3** **Sekiguchi, Yasuki**, Japan  
Development of a Prototypical Design Support System for Branch-and-Bound Type Algorithms
- TU/2P4** **Kikuchi, Takahiro**, Japan  
**Tashiro, Yoshihiko**, Japan  
**Yamada, Hideaki**, Japan  
Formalization of Learning Process in Program Design - From Requirement Specifications to Computer Programming
- 

**TU/3A**  
**Tutorial-and-Survey Lecture III**

---

- TU/3A1&2** **Korte, Bernhard**, FRG  
Applications of Combinatorial Optimization\*
- TU/3A3&4** **Fujishige, Satoru**, Japan  
Linear and Nonlinear Optimization Problems with Submodular Constraints\*
- 

**TU/3B**  
**Tutorial-and-Survey Lecture IV**

---

Tuesday, August 30

**TU/3B1&2** **Schnabel, R. B.**, USA  
Unconstrained Optimization\*

**TU/3B3&4** **Gill, Philip E.**, USA  
Nonlinear Programming\*

---

## **TU/3D** **Parallel Computing in Mathematical Programming II**

---

**TU/3D1** **Bertocchi, Marida**, Italy  
Numerical Experiences on Parallel Algorithms for Local and Global Optimization

**TU/3D2** **Ho, James K.**, USA  
Decomposition of Linear Programs Using Parallel Computation

**TU/3D3** **Boxma, O. J.**, Netherlands  
**Kindervater, G. A. P.**, Netherlands  
A Queueing Network Model for a Class of Branch and Bound Algorithms on a Master-Slave Architecture

**TU/3D4** **Edwards, Jenny**, Australia  
**Hall, Michael**, Australia  
Solution of a Nonlinear Programming Problem with a Vector Machine

---

## **TU/3E** **Complementarity Problems\***

---

Organizer and Chairperson: **Pang, Jong-Shi**, USA

**TU/3E1** **Steinberg, Richard**, USA  
**Stone, Richard E.**, USA  
The Prevalence of Paradoxes in Transportation Equilibrium Problems\*

**TU/3E2** **Kyparisis, Jerzy**, USA  
Sensitivity Analysis for Nonlinear Complementarity Problems\*

**TU/3E3** **Ha, Cu Duong**, USA  
Strong Stability of Nonlinear Complementarity Problems\*

**TU/3E4** **Kostreva, Michael M.**, USA  
An All Solutions Homotopy for the Linear Complementarity Problem\*

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## **TU/3F** **Markov Decision Processes\***

---

Organizer and Chairperson: **Ohno, Katsuhisa**, Japan

**Tuesday, August 30**

**TU/3F1 Schweitzer, Paul J., USA**

Aggregation-Disaggregation for Markovian Decision Problems\*

**TU/3F2 Kurano, Masami, Japan**

Minimum Point Approaches in Average Cost Markov Decision Processes under the Hypothesis of Doeblin\*

**TU/3F3 Sawaki, Katsushige, Japan**

A Dynamic Approach to Airline Seat Allocation Problems\*

**TU/3F4 Kawai, Hajime, Japan**

A Markov Decision Process with a Constraint\*

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## **TU/3L**

### **Mathematical Programming in Medicine II**

---

**TU/3L1 Pedreira, C. E., Brazil**

**Vila, V. B., Brazil**

Optimal Schedule for Cancer Chemotherapy

---

## **TU/3M**

### **Mathematical Programming in Management III**

---

**TU/3M1 Nishikawa, Yoshikazu, Japan**

**Nomura, Junji, Japan**

**Sawada, Kazuya, Japan**

**Nakajima, Ryoji, Japan**

Prediction Support System "MAPSS" Utilizing Expert Knowledge

**TU/3M2 Zhou, Zun-Jian, China**

An Economic Interpretation on the Relaxed Variable of Linear Programming and its Application in the Business Contending

**TU/3M3 Sha, Ju-Zhen, China**

**Li, Ming-Xing, China**

Optimal Control of Purchasing and Supplying in Harbin City

**TU/3M4 Wan, Zhuoxin, China**

Mathematical Program Model on Strategic Decision in Opening Business

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## **TU/3N**

### **Multi-Criteria Optimization I**

---

**Tuesday, August 30**

- TU/3N1** **Gu, Peiliang**, China  
**Xie, Donghui**, China  
Interactive Multi-Objective Programming of Water Resources Supply-Demand System in Tianjin

- TU/3N2** **Guo, Kai Zhong**, China  
A New Method on Constructing Judgement Matrix

- TU/3N3** **Martein, Laura**, Italy  
**Cambini, Alberto**, Italy  
On the Bicriteria Maximization Problem

---

**TU/3O**  
**Mathematical Programming Applications to Electric Power Systems II**

---

- TU/3O1** **Clímaco, João**, Portugal  
**Antunes, Carlos**, Portugal  
**Martins, António**, Portugal  
**Marta, João**, Portugal  
**Almeida, Aníbal**, Portugal  
Power Generation Expansion Planning-Comparison of Several Interactive MOLP Approaches

- TU/3O2** **Aoki, Kenichi**, Japan  
**Kanezashi, Masakazu**, Japan  
A Decomposition Method for Optimal Reactive Power Planning

- TU/3O3** **Aoki, Kenichi**, Japan  
**Nara, Koichi**, Japan  
**Nishikori, Akimine**, Japan  
**Fan, Mingtian**, Japan  
**Kanezashi, Masakazu**, Japan  
An Approximation Algorithm for Large-Scale Nonlinear Mixed-Integer Programming and its Application to Electric Power Systems

- TU/3O4** **Sandrin, Patrick**, France  
Optimal Operation of EDF Generation System Using Decomposition-Coordination Methods

---

**TU/3P**  
**Mathematical Programming in Manufacturing I\***

---

- Coorganizers: **Sethi, Suresh**, Canada  
**Kusiak, Andrew**, Canada  
Chairperson: **Kusiak, Andrew**, Canada

**Tuesday, August 30**

**TU/3P1** **Bassok, Yehuda, USA**  
**Akella, Ram, USA**

Combined Component Ordering and Production Decisions in Flexible Electronic Assembly Systems with Supply and Demand\*

**TU/3P2** **Hillion, H. P., France**  
**Harhalakis, G., France**  
Preliminary Design of Manufacturing Systems\*

**TU/3P3** **Kusiak, Andrew, Canada**  
Scheduling of Manufacturing Systems\*

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## **TU/4B**

### **Interior Point Methods in Linear Programming IV**

---

**TU/4B1** **Cheng, Yun-Chian, USA**  
**Houck, David, USA**  
**Housos, Efthymios, USA**  
**Huang, Chih-Chung, USA**  
**Liu, Jun-Min, USA**  
**Meketon, Marc, USA**  
**Slutsman, Lev, USA**  
**Vanderbei, Robert J., USA**  
**Wang, Pyng, USA**  
The AT&T KORBX(TM) Linear Programming System: System Architecture and Performance

**TU/4B2** **Cheng, Yun-Chian, USA**  
**Houck, David, USA**  
**Liu, Jun-Min, USA**  
**Meketon, Marc, USA**  
**Slutsman, Lev, USA**  
**Vanderbei, Robert J., USA**  
**Wang, Pyng, USA**  
The AT&T KORBX(TM) Linear Programming System: Algorithms

**TU/4B3** **Adler, Ilan, USA**  
**Karmarkar, Narendra K., USA**  
**Resende, Mauricio G. C., USA**  
**Veiga, Geraldo, USA**  
Data Structures, Programming Techniques and Testing of Karmarkar's Algorithm for Linear Programming

**TU/4B4** **Liu, Jun-Min, USA**  
The AT&T KORBX(TM) Linear Programming System: Super Graph Minimum Degree Ordering

**Tuesday, August 30**

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## **TU/4C Unconstrained Nonlinear Optimization II**

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- TU/4C1** **Amaya, Jorge**, Chile  
A Differential Equations Approach to Function Minimization
- TU/4C2** **Mráz, František**, Czechoslovakia  
On Local Extremum of Quadratic Function with Linear Constraints (Beale's Method)
- TU/4C3** **Sheng, Songbai**, China  
**Xu, Huifu**, China  
Broyden Family of Collinear Scaling Algorithm for Unconstrained Optimization\*
- 

## **TU/4D Parallel Algorithms for Large-Scale Networks and Linear Programs\***

---

Organizer: **Mangasarian, Olvi L.**, USA  
Chairperson: **Meyer, Robert R.**, USA

- TU/4D1** **Dembo, Ron S.**, Canada  
A Parallel Algorithm for the Multicommodity-Flow Problem\*
- TU/4D2** **Shiau, Tzong-Huei**, USA  
Massively Parallel Computing for Large-Scale Linear Programming Problems\*
- TU/4D3** **Meyer, Robert R.**, USA  
Parallel Algorithms for Large-Scale Network Optimization Problems\*
- TU/4D4** **Clausen, Jens**, Denmark  
**Traff, Jesper**, Denmark  
Parallel Graph Partitioning Using Branch-and-Bound with Dynamic Distribution of Subproblems
- 

## **TU/4E Nonlinear Complementarity Problems I\***

---

Organizer and Chairperson: **Kojima, Masakazu**, Japan

- TU/4E1** **Saigal, Romesh**, USA  
Solving Non-linear Programs as Complementarity Problems\*
- TU/4E2** **Dai, Yang**, China  
**Yamamoto, Yoshitsugu**, Japan  
A Path Following Algorithm for Stationary Point Problem on Polyhedral Cone\*

**Tuesday, August 30**

- TU/4E3** **Kremers, Hans**, Netherlands  
**Talman, Dolf**, Netherlands  
Solving the Nonlinear Complementarity Problem with Lower and Upper Bounds\*
- TU/4E4** **Ogasawara, Hideho**, Japan  
Application of an Iterative Method to a Class of Semilinear Complementarity Problems\*
- 

**TU/4F**  
**Stochastic Programming I\***

---

Organizer and Chairperson: **Birge, John R.**, USA

- TU/4F1** **Birge, John R.**, USA  
Efficient Bounds for Multistage Stochastic Linear Programs\*
- TU/4F2** **King, Alan J.**, USA  
Approximation with Empirical Measures in Linear-Quadratic Stochastic Programming: Asymptotic Properties\*
- TU/4F3** **Ziemba, William T.**, Canada  
**Hausch, Donald B.**, USA  
Cross Track Betting on Major Horseraces\*
- TU/4F4** **Wallace, Stein W.**, Norway  
**Wets, Roger J-B.**, USA  
Preprocessing in Stochastic Programming: The Case of Uncapacitated Networks\*
- 

**TU/4G**  
**Computational Logic\***

---

Organizer and Chairperson: **Jeroslow, Robert G.**, USA

- TU/4G1** **Hooker, John**, USA  
Cutting Plane Solution of Inference Problems\*
- TU/4G2** **Chandru, Vijaya**, USA  
**Coullard, Collette R.**, USA  
**Montanez, Miguel**, USA  
On Horn and Related Structures in Propositional Logic\*
- TU/4G3** **Jaumard, Brigitte**, Canada  
**Hansen, Pierre**, USA  
Partitioning Problems and Satisfiability\*

Tuesday, August 30

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## **TU/4H Combinatorial Optimization III\***

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Organizer: **Ibaraki, Toshihide**, Japan

Chairperson: **Nishizeki, T.**, Japan

**TU/4H1** **Burkard, Rainer E.**, Austria

**Fruhwirth, Bernd**, Austria

**Rote, Günther**, Austria

Approximation of Convex Curves with Application to the Bicriterial Min Cost Flow Problem\*

**TU/4H2** **Nagamochi, Hiroshi**, Japan

**Fukushima, Masao**, Japan

**Ibaraki, Toshihide**, Japan

Convex and Linear Multicommodity Flow Problems\*

**TU/4H3** **Camerini, Paolo M.**, Italy

**Galbiati, Giulia**, Italy

**Maffioli, Francesco**, Italy

Random Pseudo-Polynomial Optimization - Part 1: Algorithms\*

**TU/4H4** **Camerini, Paolo M.**, Italy

**Galbiati, Giulia**, Italy

**Maffioli, Francesco**, Italy

Random Pseudo-Polynomial Optimization - Part 2: Applications\*

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## **TU/4I Combinatorial Optimization IV**

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**TU/4I1** **Hochbaum, Dorit S.**, USA

**Adler, Ilan**, USA

**Shanthikumar, G. J.**, USA

Nonlinear Separable Optimization is Not Much Harder than Linear Optimization

**TU/4I2** **Nishihara, Osamu**, Japan

**Kumamoto, Hiromitsu**, Japan

**Inoue, Koichi**, Japan

Integer Programming Approaches to the Minimum Feedback Arc Set Problem

**TU/4I3** **Terada, Routho**, Brazil

Probabilistic Analysis of Optimal Algorithms for Three NP-Hard Problems

Tuesday, August 30

- TU/4I4** **Liebling, Thomas M.**, Switzerland  
**Margot, François**, Switzerland  
**Prodon, Alain**, Switzerland  
Optimum Disjoint Paths on Two-Trees\*
- 

**TU/4J**  
**Nonconvex and Global Optimization I**

---

- TU/4J1** **Hansen, Pierre**, USA  
**Jaumard, Brigitte**, Canada  
**Lu, Shi-Hui**, USA  
Analytical Approach to Global Optimization
- TU/4J2** **Ratschek, Helmut**, FRG  
Interval Tools for Global Optimization
- TU/4J3** **Mladineo, Regina Hunter**, USA  
Global Optimization on Supercomputers
- TU/4J4** **Thach, Phan Thiêñ**, Vietnam  
Decomposition Methods for the Min Concave Cost Flow Problem
- 

**TU/4K**  
**Computational Geometry I\***

---

Organizer and Chairperson: **Imai, Hiroshi**, Japan

- TU/4K1** **Chazelle, Bernard**, USA  
Probabilistic Methods for Multidimensional Searching\*
- TU/4K2** **Edelsbrunner, Herbert**, USA  
**Guibas, Leonidas**, USA  
**Sharir, Micha**, USA  
The Complexity of Many Cells in Arrangements of Planes and Related Problems\*
- TU/4K3** **Rappaport, David**, Canada  
Computing Simple Circuits in the Plane\*
- 

**TU/4L**  
**Multi-Objective Approach to Public Systems\***

---

Organizer and Chairperson: **Tamura, Hiroyuki**, Japan

- TU/4L1** **Chankong, Vira**, USA  
Multiobjective Analysis: Has It Been a Useful Decision-Aid?\*

**Tuesday, August 30**

- TU/4L2** **Seo, Fumiko**, Japan  
Utilization of Mathematical Programming in Group Decision Making\*
- TU/4L3** **Fujita, Shin-ichi**, Japan  
**Koi, Hiroshi**, Japan  
**Tamura, Hiroyuki**, Japan  
Application of Multi-Objective Techniques to the Environmental Impact Analysis of Heavy Road Traffic\*
- TU/4L4** **Tamura, Hiroyuki**, Japan  
**Matsui, Yoshiro**, Japan  
**Nakamura, Yutaka**, Japan  
A Multi-Objective Approach to Public Risk Assessment\*
- 

**TU/4M**  
**Mathematical Programming in Finance\***

---

Organizer and Chairperson: **Sawaki, Katsushige**, Japan

- TU/4M1** **Ziemba, William T.**, Canada  
**MacLean, Len C.**, Canada  
**Blazenko, George**, Canada  
Growth Versus Security in Dynamic Investment Analysis\*

- TU/4M2** **Tabata, Yoshio**, Japan  
Stock Index Futures KABUSAKI 50 and its Evaluation\*
- 

**TU/4N**  
**Multi-Criteria Optimization II**

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- TU/4N1** **Baba, Norio**, Japan  
A New Collision Avoidance Planning of a Robot Manipulator by the Multiobjective Programming Method
- TU/4N2** **Sakawa, Masatoshi**, Japan  
**Yano, Hitoshi**, Japan  
Generalized Scalarization Methods for Multiobjective Optimization Problems
- TU/4N3** **Masuda, Teruo**, Japan  
**Ishii, Hiroaki**, Japan  
Two Machine Open Shop Scheduling Problem with Bicriteria
- TU/4N4** **Khan, Zulfiqar Ali**, Japan  
**Ishii, Hiroaki**, Japan  
On Multiple Objective Nonlinear Fractional Programming

**Tuesday, August 30**

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## **TU/4O** **Infinite Programming**

---

**TU/4O1** **Panier, Eliane R.**, USA

**Tits, André L.**, USA

A Globally Convergent Algorithm with Adaptively Refined Discretization for Semi-Infinite Programming

**TU/4O2** **Takeuchi, Kei**, Japan

**Akahira, Masafumi**, Japan

On Quadratic Programming with Non-Regular Constraints

**TU/4O3** **Jeyakumar, V.**, Canada

**Wolkowicz, H.**, Canada

Characterizations of Optimality for Abstract, Partially Finite, and Infinite Convex Programs

---

## **TU/4P**

### **Mathematical Programming and Flexible Manufacturing\***

Organizer: **Grötschel, Martin**, FRG

Chairperson: **Truemper, K.**, USA

**TU/4P1** **Kusiak, Andrew**, Canada

Automated Manufacturing Systems: A Knowledge-Based and Optimization Approach\*

**TU/4P2** **Serafini, Paolo**, Italy

**Tiozzo, Fabio**, Italy

**Ukovich, Walter**, Italy

Job Shop Scheduling in a Real Environment

**TU/4P3** **Mittal, A. K.**, India

**Yarlagadda, R. B.**, India

**Venkateswar, K.**, India

Due Date Perturbations for Single Machine Scheduling to Minimize Tardiness

**TU/4P4** **Li, Ming-Xing**, China

**Sha, Ju-Zhen**, China

Optimal Control for System of Machine Repair

**Wednesday, August 31**

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**WE/1A**

**Martin Beale Memorial Lecture**

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**WE/1A1&2 Tomlin, John A., USA**

The Influences of Algorithmic and Hardware Developments on Computational Mathematical Programming\*

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**WE/2A**

**Martin Beale Memorial Session\***

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Organizer and Chairperson: **Tomlin, John A., USA**

**WE/2A1 Forrest, J. J. H., USA**

Linear Programming Using the IBM 3090 Vector Facility\*

**WE/2A2 Gill, Philip E., USA**

**Murray, Walter, USA**

**Saunders, Michael A., USA**

**Wright, Margaret H., USA**

A Practical Anti-Cycling Procedure for Linear and Nonlinear Programming\*

**WE/2A3 Megiddo, Nimrod, USA**

Switching from a Primal-Dual Newton Algorithm to a Primal-Dual (Interior) Simplex Algorithm\*

**WE/2A4 Golshtain, E. G., USSR**

A Decomposition Method for Convex Programming\*

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**WE/2B**

**Interior Point Methods in Linear Programming V**

---

**WE/2B1 Tone, Kaoru, Japan**

Experiments on a Projected Newton Method for Linear Programming

**WE/2B2 Oohori, Takahumi, Japan**

**Ohuchi, Azuma, Japan**

An Efficient Implementation of Karmarkar's Algorithm for Large Sparse Linear Programs

**WE/2B3 Shi, Miaogen, China**

**Miyazaki, Tomoaki, Japan**

Local Quadratic Convergence and Numerical Experiments of Multiplicative Penalty Function Algorithm for Linear Programming

Wednesday, August 31

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**WE/2B4 Herskovits, José, Brazil  
Coelho, Carlos A., Brazil**

A General Approach for Interior Point Methods in Mathematical Programming.  
Part I - Linear Programming

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## **WE/2C Nonlinear Optimization II**

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**WE/2C1 Lootsma, Freerk Auke, Netherlands**

Dual Methods for Large-Scale Partially-Separable Nonlinear Optimization

**WE/2C2 Cho, Seong-Cheol, Korea  
Kim, Sehun, Korea**

Symmetric  $\epsilon$ -Optimality Relations Between Primal Decomposition and Dual Decomposition

**WE/2C3 Hearn, Donald W., USA  
Lawphongpanich, Siriphong, USA**

Lagrangian Dual Ascent by Generalized Linear Programming

**WE/2C4 Contesse, Luis B., Chile**

A Complete Local Convergence Result for the Method of Multipliers and a New Modified Version of it

---

## **WE/2D Linear Programming I**

---

**WE/2D1 Gal, Tomas, FRG**

New Results in the Theory and Application of Degeneracy Graphs\*

**WE/2D2 Zhang, Xiang-Sun, China  
Du, Ding-Zhu, China**

Solution Property of Linear Programs with Parameters in the Right Side of the Constraints\*

**WE/2D3 Rohn, Jiri, Czechoslovakia**

Sensitivity of a Linear Program to Data Rounding\*

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## **WE/2E Simplicial Fixed Point Methods\***

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Organizer and Chairperson: **Talman, Dolf, Netherlands**

**WE/2E1 Forster, Walter, United Kingdom**

Simplicial Fixed Point Algorithms and Systems of Polynomial Equations\*

Wednesday, August 31

**WE/2E2** **van der Laan, Gerard**, Netherlands  
Economic Equilibria on the Product Space of Unit Simplices

**WE/2E3** **Doup, Tim**, Netherlands  
**van den Elzen, Antoon**, Netherlands  
**Talman, Dolf**, Netherlands  
Homotopy Interpretation of Simplicial Algorithms on the Unit Simplex\*

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**WE/2F**  
**Fuzzy Mathematical Programming I\***

---

Organizer and Chairperson: **Zimmermann, Hans-Jürgen**, FRG

**WE/2F1** **Zimmermann, Hans-Jürgen**, FRG  
Fuzzy Mathematical Programming - Introduction and Survey\*

**WE/2F2** **Sakawa, Masatoshi**, Japan  
**Yano, Hitoshi**, Japan  
A Unified Approach for Multiobjective Linear Programming Problems with Fuzzy Coefficients\*

**WE/2F3** **Tanaka, Hideo**, Japan  
**Watada, Junzo**, Japan  
**Hayashi, Isao**, Japan  
Interval Linear Regression Analysis by Linear Programming\*

**WE/2F4** **Inuiguchi, Masahiro**, Japan  
**Kume, Yasufumi**, Japan  
A Goal Program with Interval Coefficients and Goals\*

---

**WE/2G**  
**Matroid Theory I\***

---

Organizer and Chairperson: **Korte, Bernhard**, FRG

**WE/2G1** **Dress, A.**, FRG  
\*

**WE/2G2** **Nakamura, Masataka**, Japan  
A Characterization of Those Polytopes on Which the Greedy Algorithm Works\*

**WE/2G3** **Las Vergnas, M.**, France  
\*

**WE/2G4** **Murota, Kazuo**, Japan  
Combinatorial Dynamical System Theory\*

**Wednesday, August 31**

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## **WE/2H Graphs and Networks I**

---

**WE/2H1** **Masuyama, Shigeru,** Japan  
**Hakimi, S. Louis,** USA  
Edge Packing in Graphs

**WE/2H2** **Masuyama, Shigeru,** Japan  
On the Tree Packing Problem

**WE/2H3** **Takahashi, Tohru,** Japan  
An Approach to International Relations Analyses by Graph Theory

**WE/2H4** **Galluccio, Anna,** Italy  
**Sassano, Antonio,** Italy  
A Min-Max Relation for the Stability Number in Claw-Free Graphs

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## **WE/2I Polyhedral Combinatorics I**

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**WE/2I1** **Bourjolly, Jean-Marie,** Canada  
**Pulleyblank, William R.,** Canada  
König-Egerváry Graphs, 2-Bicritical Graphs and Fractional Matchings

**WE/2I2** **Conforti, Michele,** USA  
**Rao, M. R.,** USA  
**Sassano, Antonio,** Italy  
The Equipartition Polytope: Formulations, Dimension and Facets

**WE/2I3** **Hoffman, Karla L.,** USA  
**Padberg, Manfred W.,** USA  
ABCOPT: A Branch & Cut Optimizer for 0-1 Linear Programs

**WE/2I4** **Pulleyblank, William R.,** Canada  
**Gamble, A. B.,** Canada  
**Horton, J. D.,** Canada  
Forest Covers, Even Forests and Polyhedral Intersection Theorems

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## **WE/2K Computational Geometry II\***

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Organizer and Chairperson: **Imai, Hiroshi,** Japan

**Wednesday, August 31**

- WE/2K1** **Ho, Jan-ming,** USA  
**Lee, D. T.,** USA  
**Chang, Chia-Hsiang,** USA  
**Wong, C. K.,** USA  
Minimum Diameter Spanning Trees and Related Problems\*
- WE/2K2** **Aurenhammer, Franz,** Austria  
Using Gale Transforms in Computational Geometry\*
- WE/2K3** **Elgindy, Hossam,** Canada  
**Toussaint, Godfried,** Canada  
Link Voronoi Diagrams Inside a Simple Polygon with Applications\*
- WE/2K4** **Imai, Hiroshi,** Japan  
**Imai, Keiko,** Japan  
**Yamamoto, Peter,** Canada  
Algorithms for Orthogonal  $L_1$  Linear Approximation of Points in Two and Higher Dimensions\*

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## **WE/2L** **Mathematical Programming in Transportation I**

---

- WE/2L1** **Zhou, Zun-Jian,** China  
Application of Floods Method to a Transportation Problem
- WE/2L2** **Paixao, José,** Portugal  
Generation of Bus Driver Schedules
- WE/2L3** **Ohuchi, Masatoshi,** Japan  
Bus Diagram Generation System
- 

## **WE/2M** **Mathematical Programming: General**

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- WE/2M1** **Wu, He-qing,** China  
**Wang, Qin-ying,** China  
**Liu, Kai-di,** China  
**Tian, Zu-kai,** China  
Principle for Optimization Object Seeking
- WE/2M2** **Farkas, Zoltán,** Hungary  
On Some Connection of an Extended Concept of Quasi-Arithmetic Means and Solution of Problems by Method “Optimization with Minimal Information”\*

**Wednesday, August 31**

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## **WE/2O Optimality Conditions**

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**WE/2O1 Flippo, Olaf E., Netherlands**

Duality Theory in General Mathematical Programming : Specially Structured Dual Solutions

**WE/2O2 Mond, B., Australia**

Invexity for Continuous Programming and Control Problems

**WE/2O3 Oettli, Werner, FRG**

A Nonlinear Theorem of the Alternative without Regularity Assumption

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## **WE/2P**

### **Mathematical Programming in Manufacturing II**

---

**WE/2P1 Luss, Hanan, USA**

Resource Allocation Problems with a Lexicographic Minimax Objective

**WE/2P2 Matsui, Masayuki, Japan**

**Suzuki, Hisatoshi, Japan**

A Mathematical Programming Approach to Designing Conveyor-Serviced Production Systems

**WE/2P3 Qiu, Changtao, China**

**Hu, Bing, China**

Optimization Design of Medium-Frequency Synchronous Machine and its Exciter Using Direct Search Approach\*

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## **WE/3A**

### **Tutorial-and-Survey Lecture V**

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**WE/3A1&2 Lootsma, Freerk Auke, Netherlands**

Multi-Objective Programming\*

**WE/3A3&4 Kiewiel, W., Poland**

Nondifferentiable Optimization\*

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## **WE/3C**

### **Nonlinear Optimization: SQP Approach I**

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**Wednesday, August 31**

**WE/3C1** **Forsgren, Anders**, Sweden  
**Gill, Philip E.**, USA  
**Murray, Walter**, USA  
Multiple Zero Lagrange Multipliers

**WE/3C2** **Moré, Jorge J.**, USA  
**Burke, James V.**, USA  
**Toraldo, Gerardo**, USA  
Convergence Properties of Trust Region Methods for Linear and Convex Constraints

**WE/3C3** **Byrd, Richard H.**, USA  
**Omojokun, Emmanuel**, USA  
A Trust Region Algorithm for General Nonlinearly Constrained Optimization

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**WE/3E**  
**Linear Complementarity Problems III**

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**WE/3E1** **Venkateswaran, V.**, USA  
Descent Algorithms for LCP's and Complementary Programming Problems

**WE/3E2** **Rohn, Jiří**, Czechoslovakia  
Solving Linear Equations with Interval Data: An Application of the Linear Complementarity Problem\*

**WE/3E3** **de Angelis, Vanda**, Italy  
Linear Complementarity Problems: Construction of Efficient Cutting Planes Based on the Convex Hull of Polyhedra\*

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**WE/3F**  
**Fuzzy Mathematical Programming II\***

---

Organizer and Chairperson: **Zimmermann, Hans-Jürgen**, FRG

**WE/3F1** **Buckley, J. J.**, USA  
Possibilistic Multiobjective Programming\*

**WE/3F2** **Rommelfanger, Heinrich**, FRG  
A New Method for Solving Linear Programming Problems\*

**WE/3F3** **Turksen, I. B.**, Canada  
Approximate Reasoning Approaches for Aggregate Production Planning\*

**WE/3F4** **Furuta, Hitoshi**, Japan  
**Shiraishi, Naruhito**, Japan  
Applications of Fuzzy Mathematical Programming in Structural Engineering\*

**Wednesday, August 31**

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## **WE/3G Combinatorial Optimization V\***

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**Organizer:** Ibaraki, Toshihide, Japan

**Chairperson:** Kise, N., Japan

**WE/3G1 Poljak, Svatopluk,** Czechoslovakia

**Schlegel, Milos,** Czechoslovakia

Maximum Ranks of Matrix Powers and Weighted Bipartite Matchings\*

**WE/3G2 Ibaraki, Toshihide,** Japan

**Simeone, Bruno,** Italy

Location on Networks with Fixed or Variable Node and Edge Costs\*

**WE/3G3 Suzuki, Hitoshi,** Japan

**Akama, Takehiro,** Japan

**Nishizeki, Takao,** Japan

Steiner Forests in Planar Graphs\*

**WE/3G4 Kostreva, Michael M.,** USA

Combinatorial Optimization in Nash Games\*

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## **WE/3H**

### **Graphs and Matroids**

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**WE/3H1 Otsuka, Motoko,** USA

**Hakimi, S. Louis,** USA

Problems in System Level Diagnosis

**WE/3H2 Laurent, Monique,** France

**Deza, Michel,** France

Bouquets of Matroids: Algebraic and Topological Properties

**WE/3H3 Iwamura, Kakuzo,** Japan

Primal Dual Algorithm for the Lexicographically Optimal Base of a Submodular Polyhedron and its Relation to a Poset Greedoid

**WE/3H4 Bachem, Achim,** FRG

Oracle Algorithms for Oriented Matroids

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## **WE/3I**

### **Polyhedral Combinatorics II**

---

**WE/3I1 Hartvigsen, David,** USA

**Zemel, Eitan,** USA

On the Complexity of Lifted Inequalities for the Knapsack Problem

**Wednesday, August 31**

**WE/3I2** **de Simone, Caterina, Italy**  
The Hamming Cone, the Cut Polytope, and the Boolean Quadratic Polytope

**WE/3I3** **Nobili, Paolo, Italy**  
**Sassano, Antonio, Italy**  
Two Composition Operations for Clutters and Related Polytopes

**WE/3I4** **Caceres, Jaime, Chile**  
**Robles, José, Chile**  
An Efficient Network Flow Formulation for Solving a Capacitated Plant Location Problem with Complex Side Constraints

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## **WE/3K** **Computational Geometry III\***

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Organizer and Chairperson: **Imai, Hiroshi, Japan**

**WE/3K1** **Asano, Tetsuo, Japan**  
Applications of Computational Geometry to VLSI Layout Design\*

**WE/3K2** **Sugihara, Kokichi, Japan**  
**Iri, Masao, Japan**  
Geometric Algorithms in Finite-Precision Arithmetic\*

**WE/3K3** **Aggarwal, Alok, USA**  
**Klawa, Maria M., USA**  
**Moran, Shlomo, Israel**  
**Shor, Peter, USA**  
**Wilber, Robert, USA**  
Geometric Applications of a Matrix-Searching Algorithm\*

**WE/3K4** **Yao, Andrew Chi-Chih, USA**  
Probabilistic Analysis of the Travelling Salesman's Problem over Unbounded Regions\*

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## **WE/3M** **Mathematical Programming in Seismic Tomography**

---

**WE/3M1** **Mohan, C., India**  
**Shanker, Kusum, India**  
**Khattri, K. N., India**  
Inversion of Seismological Data Using a Random Search Global Optimization Technique

**WE/3M2** **Wang, Jia-Song, China**  
A New Method for Solving the Minimization of  $L_1$  Norm in Seismic Inverse Problem

**Wednesday, August 31**

**WE/3M3** **Wang, Jia-Song**, China  
**Chen, Zhog-wen**, China

Solution to the Model of  $L_1$  Norm Minimization in Seismic Inverse

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**WE/3N**  
**Stochastic Programming II**

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**WE/3N1** **Yu, Chien-Chih**, China

An Implicit Stochastic Dynamic Programming Approach for the Optimization of Multiperiod Control Systems

**WE/3N2** **Yang, Yaguang**, China

A New Approach to Uncertain Linear Programming

**WE/3N3** **Nazareth, J. L.**, USA

Solution Techniques for Stochastic Linear Programs with Complete Recourse

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**WE/3P**  
**Mathematical Programming on Personal Computers**

---

**WE/3P1** **Kelmanson, Milton L.**, Brazil

**Lisandre, Bernard**, Brazil

**de Araujo, Marco A. F.**, Brazil

**Schneider, Ruben, Filho**, Brazil

Micro SAGCE - A Micro Computer Teaching Aid for Linear Programming

**WE/3P2** **Sgurev, Vasil**, Bulgaria

**Vassilev, Vasil**, Bulgaria

A Program System for Solving Problems of Mathematical Programming

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**WE/4B**

**Interior Point Methods in Linear Programming VI\***

---

Organizer and Chairperson: **Tone, Kaoru**, Japan

**WE/4B1** **Mizuno, Shinji**, Japan

**Masuzawa, Kaori**, Japan

Primal Dual Interior Point Algorithms for Transportation Problems\*

**WE/4B2** **Tanabe, Kunio**, Japan

**Tsuchiya, Takashi**, Japan

Global Analysis of Dynamical Systems Associated with Karmarkar's Method for Linear Programming\*

**Wednesday, August 31**

- WE/4B3** **Tamura, Akihisa**, Japan  
**Takehara, Hitoshi**, Japan  
**Fukuda, Komei**, Japan  
**Fujishige, Satoru**, Japan  
**Kojima, Masakazu**, Japan  
A Dual Interior Primal Simplex Method for Linear Programming\*
- WE/4B4** **Freedman, Barry A.**, USA  
**Ikura, Yoshiro**, USA  
**Sinha, Lakshman P.**, USA  
A New Karmarkar-Based Resource-Directed Decomposition Algorithm for Large-Scale Operator Scheduling Problems\*

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## **WE/4C** **Nonlinear Optimization III**

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- WE/4C1** **Fraleys, Christina**, Switzerland  
Sequential Quadratic Programming Methods for Nonlinear Least-Squares Problems
- WE/4C2** **Takahashi, Toshihiko**, Japan  
**Yabe, Hiroshi**, Japan  
Factorized Quasi-Newton Methods for Nonlinear Least Squares Problems
- WE/4C3** **Kallio, Markku**, Finland  
**Salo, Seppo**, Finland  
On the Solution of Partial Equilibrium Models
- WE/4C4** **Chankong, Vira**, USA  
Partitioning and Sectional Search Methods for Large Nonlinear Programs

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## **WE/4D** **Linear Programming: Matrix Factorization**

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- WE/4D1** **Murota, Kazuo**, Japan  
Principal Structure of a Layered Mixed Matrix
- WE/4D2** **Mitra, Gautam**, United Kingdom  
**Tamiz, Mehrdad**, United Kingdom  
A Comparison of Alternative Methods for Representing the Inverse of Linear Programming Basis Matrices\*
- WE/4D3** **Chuang, Min Hwei**, Singapore  
**Land, Ailsa**, United Kingdom  
Using the Sparse Matrix Approach to Update Simplex Iteration Solutions after Addition of Constraints

**Wednesday, August 31**

- WE/4D4** **Hattersley, Bob**, United Kingdom  
**Mackley, Lynne**, United Kingdom  
Construction of LU Factors of the Basis to Reduce Build-up during Simplex Iterations
- 

**WE/4E**  
**Linear Complementarity Problems IV**

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- WE/4E1** **Solow, Daniel**, USA  
**Roy, Syamal**, USA  
The Last 'Major' Linear Complementarity Algorithm
- WE/4E2** **Eagambaram, N.**, India  
**Mohan, S. R.**, India  
On Some Classes of Linear Complementarity Problems with Matrices of Order  $n$  and Rank  $(n - 1)$ .
- WE/4E3** **Eagambaram, N.**, India  
**Mohan, S. R.**, India  
Some Results on the Linear Complementarity Problems with an  $N$ -Matrix
- WE/4E4** **Júdice, Joaquim J.**, Portugal  
**Pires, Fernanda M.**, Portugal  
Solution of Large-Scale Linear Complementarity Problems by Bard-type Methods
- 

**WE/4F**  
**Fuzzy Mathematical Programming III\***

---

Organizer and Chairperson: **Zimmermann, Hans-Jürgen**, FRG

- WE/4F1** **Trauwaert, Etienne**, Belgium  
Fuzzy Objective Functions and Their Capacity to Isolate Fairly Unequal Clusters\*
- WE/4F2** **Lodwick, Weldon**, USA  
Finding Redundancies and Reduction in Fuzzy Linear Programming Problems\*
- WE/4F3** **Ishii, Hiroaki**, Japan  
**Masuda, Teruo**, Japan  
Fuzzy One Machine Scheduling Problems
- 

**WE/4G**  
**Matching and Related Topics\***

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Organizer and Chairperson: **Cunningham, William H.**, Canada

- WE/4G1** **Barahona, Francisco**, Canada  
Via Minimization and Chinese Postman\*

Wednesday, August 31

- WE/4G2** **Conforti, Michele, USA**  
**Cornuéjols, Gérard, USA**  
**Rao, M. R., USA**  
Recent Results on the Decomposition of Balanced and Perfect Matrices\*

- WE/4G3** **Coullard, Collette R., USA**  
**Pulleyblank, William R., Canada**  
Cycle Cones and Polyhedra\*

- WE/4G4** **Sebö, Andras, France**  
Integrality in Plane Multicommodity Flows\*

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**WE/4H**  
**Combinatorial Optimization VI\***

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Organizer: **Ibaraki, Toshihide, Japan**  
Chairperson: **Masuyama, Shigeru, Japan**

- WE/4H1** **Hell, Pavol, Canada**  
**Kirkpatrick, David, Japan**  
**Li, Brenda, Hong Kong**  
Combinatorial Controlled Rounding Algorithms\*

- WE/4H2** **Balas, Egon, USA**  
Asymmetric Facets of the Directed Hamilton Cycle Polytope\*

- WE/4H3** **Jeroslow, Robert G., USA**  
**Wang, Jinchang, USA**  
Integral Polyhedra Associated with Some Dynamic Programs\*

- WE/4H4** **Tind, Jørgen, Denmark**  
**Balas, Egon, USA**  
**Tama, Joseph M., USA**  
Sequential Convexification in Reverse Convex and Disjunctive Programming\*

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**WE/4J**  
**Nonconvex and Global Optimization II**

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- WE/4J1** **Thakur, Lakshman S., USA**  
A Nonconvex Programming Algorithm: Minimizing a Quadratic Concave Objective over a Polyhedron

- WE/4J2** **Tardella, Fabio, Italy**  
On a Class of Functions Attaining the Maximum at the Vertices of a Polyhedron\*

- WE/4J3** **Schoen, Fabio, Italy**  
Optimal and Suboptimal Stopping Rules for Global Optimization

Wednesday, August 31

**WE/4J4 Galperin, Efim A., Canada**  
Full Global Optimization via Cubic Algorithm

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**WE/4K**  
**Computational Geometry IV\***

---

Organizer and Chairperson: **Imai, Hiroshi, Japan**

**WE/4K1 Yao, F. Frances, USA**  
Dynamic Programming and Geometric Optimization\*

**WE/4K2 Ebara, Hiroyuki, Japan**  
**Nakano, Hideo, Japan**  
**Nakanishi, Yoshiro, Japan**  
A Parallel Algorithm for Constructing the Half-Plane Intersection and its Applications

**WE/4K3 Cox, Pedro, France**  
**Maitre, Henri, France**  
**Minoux, Michel, France**  
**Ribeiro, Celso, Brazil**  
Optimal Matching of 2-D Contours

**WE/4K4 Chew, Paul, USA**  
**Fortune, Steven, USA**  
Sorting Helps for Voronoi Diagrams\*

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**WE/4L**  
**Mathematical Programming in Transportation II**

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**WE/4L1 Feng, Cheng-Min, China**  
**Ngai, Chris, China**  
Traffic Assignment and Population Allocation by Multiple Objective Programming

**WE/4L2 Tzeng, Gwo-Hshiung, China**  
**Chen, Chao-Yan, China**  
**Chen, Hsin-Der, China**  
An Algorithm for Obtaining the Optimal Storage and Transportation System of Oil Products

**WE/4L3 Suzuki, Hisatoshi, Japan**  
**Hirabayashi, Ryuichi, Japan**  
**Tsuji, Masato, Japan**  
Vehicle Routing Problem with Split Delivery

**Wednesday, August 31**

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## **WE/4M**

### **Mathematical Programming in Communication Network Design I\***

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Organizer and Chairperson: **Hashida, On**, Japan

**WE/4M1 Gavish, Bezalel**, USA

**Helme, Marcia**, USA

**Kai, Sheng-Roan**, USA

Congregator Placement and Link Expansion in Local Access Networks\*

**WE/4M2 Shinohara, Masaaki**, Japan

A Descent Algorithm for Dimensioning Circuit-Switched Networks with Nonlinear Link Cost\*

**WE/4M3 Kamimura, Kunio**, Japan

**Nishino, Hisakazu**, Japan

Optimal Flow and Capacity Assignments of Elementary Packet-Switched Networks\*

**WE/4M4 Groenevelt, Harry**, USA

Designing Priority Rules for Queueing Systems by Nonlinear Programming

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## **WE/4N**

### **Stochastic Programming III**

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**WE/4N1 Morita, Hiroshi**, Japan

**Ishii, Hiroaki**, Japan

**Nishida, Toshio**, Japan

Stochastic Linear Programming Problem with Partially Estimated Constraint

**WE/4N2 Novikova, Natalia M.**, USSR

Stochastic Programming for Solving Non-Smooth Convex-Concave Variational Inequalities

**WE/4N3 Haneveld, Willem K. Klein**, Netherlands

Multilinear Approximation on Rectangles and the Related Moment Problem

**WE/4N4 Uryas'ev, Stanislav**, Austria

New Variable Metric Methods for the Nonsmooth Stochastic Optimization and Game Theoretic Problems

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## **WE/4O**

### **Nondifferentiable Optimization I**

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**Wednesday, August 31**

**WE/4O1 Overton, Michael L., USA**

**Womersley, Robert S., Australia**

On Minimizing the Spectral Radius of a Nonsymmetric Matrix Function - Optimality Conditions and Duality Theory

**WE/4O2 Overton, Michael L., USA**

On Minimizing the Maximum Eigenvalue of a Symmetric Matrix - Optimality Conditions, Duality Theory and Algorithms

**WE/4O3 Kim, Sehun, Korea**

**Park, Jae-Ha, Korea**

**Cha, Young-chul, Korea**

**Ahn, Hyun-sil, Korea**

Polyak's Method with  $\epsilon$ -Subgradient for Nondifferentiable Optimization Problem

## Thursday, September 1

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### **TH/1A L. V. Kantorovich Memorial Lecture**

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**TH/1A1&2 Romanovskii, I. V., USSR**  
Kantorovich's Work on Mathematical Programming\*

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### **TH/2A L. V. Kantorovich Memorial Session\***

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Coorganizers: **Romanovskii, I. V., USSR**  
**Tanabe, Kunio, Japan**

Chairperson: **Romanovskii, I. V., USSR**

**TH/2A1 Yamamoto, Tetsuro, Japan**  
**Chen, Xiaojun, China**  
Some Topics on the Newton-Kantorovich Theorem\*

**TH/2A2 Dikin, Ilya, USSR**  
Determination of Internal Feasible Point\*

**TH/2A3 Kubota, Koichi, Japan**  
A Software for Fast Automatic Differentiation\*

**TH/2A4 Gens, G. V., USSR**  
**Levner, E. V., USSR**  
Fast Approximation Algorithms for Scheduling Problems in Flexible Manufacturing Systems\*

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### **TH/2B Linear Programming: New Methods**

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**TH/2B1 Sherali, Hanif D., USA**  
**Ulular, Osman, USA**  
A Primal-Dual Conjugate Subgradient Algorithm for Specially Structured Linear Programming Problems

**TH/2B2 Suzuki, Shigemichi, Japan**  
A Method for Linear Programming by Optimizing the Objective Function in a Region of Influence

**TH/2B3 Jiao, Yongchang, China**  
**Chen, Kaizhou, China**  
A New Method for Solving Large Scale Sparse Linear Programming

**Thursday, September 1**

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## **TH/2C**

### **Interior Point Methods in Nonlinear Optimization I**

---

**TH/2C1** **Freedman, Barry A.**, USA

**Puthenpura, Sarat C.**, USA

**Sinha, Lakshman P.**, USA

A New Karmarkar-Based Algorithm for Optimizing Convex, Non-Linear Cost Functions with Linear Constraints

**TH/2C2** **Evtushenko, Yuri**, USSR

**Zhadan, Vitali**, USSR

Classification of Nonlinear Programming Techniques\*

**TH/2C3** **Jarre, Florian**, FRG

**Sonnevend, György**, Hungary

**Stoer, Josef**, FRG

Analytical Centres and Their Applications in Convex Optimization\*

**TH/2C4** **Nesterov, Jurii**, USSR

**Nemirovsky, Arkadii**, USSR

A General Approach to Polynomial-Time Algorithms Design for Convex Programming\*

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## **TH/2D**

### **Mathematical Programming Software Systems\***

---

Coorganizers: **Schittkowski, K.**, FRG

**Tits, André L.**, USA

Chairperson: **Tits, André L.**, USA

**TH/2D1** **Ho, James K.**, USA

Nonprocedural Implementation of Mathematical Programming Algorithms

**TH/2D2** **Saigal, Romesh**, USA

A Mathematical Programming System for Microcomputers\*

**TH/2D3** **Fan, Michael K. H.**, USA

**Koninckx, Jan**, USA

**Tits, André L.**, USA

**Wang, Li-Sheng**, USA

Interactive Optimization-Based Engineering System Design: Console\*

**TH/2D4** **Idnani, Ashok**, USA

Natural Interface to Solution Algorithms\*

Thursday, September 1

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## **TH/2E Variational Inequalities I\***

Organizer and Chairperson: **Kyparisis, Jerzy**, USA

**TH/2E1 Kyparisis, Jerzy**, USA

Sensitivity Analysis for Variational Inequalities: Theory and Applications\*

**TH/2E2 Pang, Jong-Shi**, USA

Further Differentiability Properties of Solutions to Parametric Variational Inequality and Complementarity Problems\*

**TH/2E3 Dafermos, Stella**, USA

Sensitivity Analysis in Variational Inequalities\*

---

## **TH/2F**

### **Nondifferentiable Optimization II\***

Coorganizers: **Fukushima, Masao**, Japan

**Goffin, Jean-Louis**, Belgium

Chairperson: **Fukushima, Masao**, Japan

**TH/2F1 Xia, Zun-Quan**, China

Some Results on Quasidifferentiable Functions\*

**TH/2F2 Kawasaki, Hidefumi**, Japan

Second-Order Directional Derivatives of a Supremum-Type Function\*

**TH/2F3 Shiraishi, Shunsuke**, Japan

First and Second Order  $\varepsilon$ -Directional Derivatives of a Marginal Function in Convex Programming with Linear Inequality Constraints\*

**TH/2F4 Polak, Elijah**, USA

**Wiest, E. Joseph**, USA

On the Removal of Ill-Conditioning Effects in a Class of Nondifferentiable Optimization Problems\*

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## **TH/2G**

### **Combinatorial Optimization VII\***

Organizer: **Ibaraki, Toshihide**, Japan

Chairperson: **Katoh, N.**, Japan

**TH/2G1 Fischetti, Matteo**, Italy

**Martello, Silvano**, Italy

**Toth, Paolo**, Italy

Approximate Algorithms for Fixed Job Schedule Problems

Thursday, September 1

- TH/2G2** **Kise, Hiroshi**, Japan  
**Ibaraki, Toshihide**, Japan  
A New Approach to Jobshop Scheduling Problem: Stage by Stage Scheduling\*
- TH/2G3** **Błazewicz, Jacek**, Poland  
New Models in Scheduling Theory\*
- TH/2G4** **Matsumoto, Jusei**, Japan  
**Ishikawa, Kenji**, Japan  
Application of Combinatorial Optimization Methods to Steel Production Planning System
- 

## **TH/2H** Graphs and Networks II

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- TH/2H1** **Sgurev, Vasil**, Bulgaria  
**Jelatova, Mariana**, Bulgaria  
**Vassilev, Vasil**, Bulgaria  
A Network Flow with Additional Non-Linear Constraints
- TH/2H2** **Yu, Chang-Sung**, China  
Simplicial Graphs
- TH/2H3** **Hsu, Lih-Hsing**, China  
**Chen, Chiuyuan**, China  
Graph Capacity Functions
- TH/2H4** **Ali, Agha Iqbal**, USA  
**Huang, Chung-Hsing**, China  
A Connected  $m$ -Tree Relaxation for  $m$ -Travelling Salesmen Problems
- 

## **TH/2I** Graph Algorithms I

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- TH/2I1** **Wagner, Donald K.**, USA  
**Coullard, Collette R.**, USA  
**Gardner, L. Leslie**, USA  
Decomposition of Minimally 3-Connected Graphs
- TH/2I2** **Hsu, Wen-Lian**, USA  
Algorithms on Circular-Arc Graphs
- TH/2I3** **Duin, Cees**, Netherlands  
**Volgenant, Anton**, Netherlands  
Reduction Tests for the Steiner Problem in Graphs

**Thursday, September 1**

**TH/2I4 Edwards, Jenny, Australia**

**Bennett, John, Australia**

The Use of Pseudoinverses in the Solution of the Graph Isomorphism Problem

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**TH/2J**

**Nonconvex and Global Optimization III**

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**TH/2J1 Huynh, Huu-Nhon, Australia**

**Kumar, Santosh, Australia**

A Random Search Method for Extreme Point Mathematical Programming

**TH/2J2 Zheng, Quan, China**

Integral Global Minimization, Algorithms, Implementation and Applications

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**TH/2K**

**Artificial Intelligence I\***

---

Organizer and Chairperson: **Hammer, Peter L., USA**

**TH/2K1 Brun, Thierry, Canada**

**Desrosiers, Jacques, Canada**

**Hansen, Pierre, USA**

**Jaumard, Brigitte, Canada**

Probabilistic Logic and Pseudo-Boolean Programming\*

**TH/2K2 Hooker, John, USA**

Mathematical Programming Methods for Multi-Valued Logic\*

**TH/2K3 Chvátal, Vašek, USA**

**Szemerédi, Endre, Hungary**

Many Hard Examples for Resolution\*

**TH/2K4 Lee, R. C. T., China**

**Tseng, S. S., China**

**Wang, Jea-Seng, China**

The Mutual Influence Between Artificial Intelligence and Algorithm Design\*

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**TH/2L**

**Mathematical Optimization in City and Regional Planning\***

---

Organizer and Chairperson: **Okabe, Atsuyuki, Japan**

**TH/2L1 Suzuki, Atsuo, Japan**

Asymptotic Behavior of the Voronoi Cells in the Geographical Optimization Problem\*

Thursday, September 1

- TH/2L2** **Suzuki, Tsutomu**, Japan  
**Asami, Yasushi**, Japan  
**Okabe, Atsuyuki**, Japan  
Sequential Allocation of Public Facilities\*

- TH/2L3** **Tanimura, Hidehiko**, Japan  
'Inversion' of Doubly-Constrained Spatial Interaction Models\*

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**TH/2N**  
**Stochastic Programming IV**

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- TH/2N1** **Tokarev, Vladislav**, USSR  
Joint Selection of Both the Regulator and the Control Programme under Uncertainty

- TH/2N2** **Endo, Kaoru**, Japan  
**Nagao, Teruya**, Japan  
Two Kinds of Information in Price Search

- TH/2N3** **Laporte, Gilbert**, Canada  
**Louveaux, François**, Belgium  
Models, Bounds and Algorithms for a Class of Vehicle Routing Problems with Stochastic Supplies

- TH/2N4** **Ariyawansa, K. A.**, USA  
On Implementing a Parallel Scheme to Compute Approximate Values and Subgradients of the Expected Recourse Function in Stochastic Programs with Complete Recourse

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**TH/3A**  
**Tutorial-and-Survey Lecture VI**

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- TH/3A1&2** **Wets, Roger J-B**, USA  
Stochastic Programming: State-of-the-Art Survey\*

- TH/3A3&4** **Yamamoto, Yoshitsugu**, Japan  
Fixed Point Algorithms for Stationary Point Problems\*

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**TH/3B**  
**Interior Point Methods in Linear Programming VII**

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- TH/3B1** **Freund, Robert**, USA  
Projective Transformations for Interior Point Algorithms, with Applications to Linear Programming and the Center Problem

Thursday, September 1

- TH/3B2** **Tsuchiya, Takashi**, Japan  
**Tanabe, Kunio**, Japan  
An Analysis on the Local Convergence Properties of New Methods in Linear Programming
- TH/3B3** **Lustig, Irvin**, USA  
A Generic Primal-Dual Interior Point Algorithm
- TH/3B4** **Gill, Philip E.**, USA  
**Marxen, Aneas**, USA  
**Murray, Walter**, USA  
**Saunders, Michael A.**, USA  
**Wright, Margaret H.**, USA  
Barrier Function Methods for Linear Programming
- 

**TH/3C**  
**Interior Point Methods in Nonlinear Optimization II**

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- TH/3C1** **Mehrotra, Sanjay**, USA  
A Method for Solving Piecewise-Linear Programs by Shrinking Polytopes
- TH/3C2** **Dumitru, Vincentiu**, Rumania  
**Luban, Florica**, Rumania  
A Generalized Huard-Iri Function for Unconstrained Optimization
- TH/3C3** **Herskovits, José**, Brazil  
A General Approach for Interior Point Methods in Mathematical Programming.  
Part II - Nonlinear Programming
- 

**TH/3D**  
**Linear Programming II**

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- TH/3D1** **Liu, Zhenguo**, China  
**Zhou, Zhiren**, China  
The Characteristic of the Base of Optimization Problems in Production Arrangement and the Algorithm of its Basic Feasible Solution
- TH/3D2** **Liu, Zhenguo**, China  
**Zhou, Zhiren**, China  
Determination of the Testing Number and Optimal Solution of a Class of Optimization Problems of Production Arrangement

Thursday, September 1

- TH/3D3** **Narayanasamy, Palanisamy, India**  
**Natesan, Ramasamy, India**  
**Sankaranarayanan, Venkatachalam, India**  
Data Structure Implementation of Multiplex and Dual Multiplex Algorithms for Solving LP Problems
- TH/3D4** **Kothanda, Ramanujam, India**  
**Narayanasamy, Palanisamy, India**  
**Natesan, Ramasamy, India**  
**Sankaranarayanan, Venkatachalam, India**  
Some Computational Aspects of Solving LP Problems Using Multiplex Algorithms
- 

**TH/3F**  
**Markov Decision Process and Dynamic Programming**

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- TH/3F1** **Rosling, Kaj, Sweden**  
New Successive Approximations for Markov Decision Processes
- TH/3F2** **Yoshida, Yuji, Japan**  
The Markovian Multi-Armed Bandit Problems with Stopping Times
- TH/3F3** **Read, E. G., New Zealand**  
**George, J. A., New Zealand**  
Dual Dynamic Programming
- TH/3F4** **Yu, Chien-Chih, China**  
A Structured Design for General Purpose Dynamic Programming Softwares
- 

**TH/3G**  
**Matroids and Submodular Functions\***

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Organizer and Chairperson: **Fujishige, Satoru, Japan**

- TH/3G1** **Truemper, Klaus, USA**  
A Matroid Technique for Analysis of Minimal Violation Matrices\*
- TH/3G2** **Cunningham, William H., Canada**  
Delta Matroids and Combinatorial Optimization\*
- TH/3G3** **Grötschel, Martin, FRG**  
**Truemper, Klaus, USA**  
Maximum Weight Cycles in Binary Matroids\*
- TH/3G4** **Qi, Liqun, USA**  
Directed Submodularity, Ditroids and Directed Submodular Flows\*

**Thursday, September 1**

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## **TH/3I Graph Algorithms II**

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- TH/3I1** **Lasinskas, Kestutis**, USSR  
**Garliauskas, Algis**, USSR  
Graph Reduction in Discrete Programming

- TH/3I2** **Zhao, Lin**, China  
Approximate Algorithm for Seeking the Dominating Cycles on Graphs

- TH/3I3** **Hochbaum, Dorit S.**, USA  
**Goldschmidt, Olivier**, USA  
A Polynomial Algorithm for the  $k$ -Cut Problem
- 

## **TH/3K Artificial Intelligence II\***

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Organizer and Chairperson: **Hammer, Peter L.**, USA

- TH/3K1** **Boros, Endre**, USA  
**Prekopa, Andras**, USA  
Probabilistic Bounds and Algorithms for the Maximum Satisfiability Problem\*

- TH/3K2** **Crama, Yves**, Netherlands  
**Hammer, Peter L.**, USA  
A Survey of Algorithmic Techniques for Satisfiability and Related Problems\*

- TH/3K3** **Hoffman, Frederick**, USA  
Combinatorial Aspects of Expert Hierarchical Configuration\*

- TH/3K4** **Simon, Jean-Claude**, France  
**Dubois, Olivier**, France  
May Sat Problems be Random Polynomial Problems?\*

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## **TH/3M Mathematical Programming in Communication Network Design II**

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- TH/3M1** **Saito, Hiroshi**, Japan  
Optimal Control of Variable Rate Coding with Incomplete Observation in Integrated Data/Voice Packet Networks

- TH/3M2** **Nakajima, Isami**, Japan  
A Circuit Dimensioning Method for a Packet-Switched Network with Different Packet Classes

**Thursday, September 1**

**TH/3M3 Monma, Clyde L., USA**

Network Design Problems with Certain Connectivity Constraints

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**TH/3N**

**Multi-Criteria Optimization III**

---

**TH/3N1 Zhong, Shounan, China**

An Optimal Compromise Solution is Decided in the Multiobjective Programming Problem

**TH/3N2 Wang, Qingyin, China**

**Zhao, Hangqing, China**

A Primary Inquire on the Policy-Deciding Method of the Most Optimal Situation

**TH/3N3 Den, Ji-liang, China**

Goal and System

**TH/3N4 Wen, Ue-Pyng, China**

A Parametric Approach to Multilevel Programming

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**TH/3O**

**Mathematical Programming in Numerical Analysis I\***

---

Organizer and Chairperson: **Kawahara, Mutsuto, Japan**

**TH/3O1 Valliappan, Somasundaram, Australia**

Numerical Integration for Finite Element Dynamic Analysis\*

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**TH/4B**

**Interior Point Methods in Linear Programming VIII**

---

**TH/4B1 Vanderbei, Robert J., USA**

**Lagarias, J. C., USA**

I. I. Dikin's Convergence Result for the Affine-Scaling Algorithm

**TH/4B2 Tanabe, Kunio, Japan**

Algorithms for Computing Search Directions of the Interior Point Methods for Linear Programming

**TH/4B3 Nesterov, Jurii, USSR**

New Polynomial-Time Algorithms for Linear and Quadratic Programming\*

**TH/4B4 Zimmermann, Uwe, FRG**

Search Directions for Projective Methods\*

**Thursday, September 1**

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## **TH/4C**

### **Algorithms and Software for Nonlinear Optimization\***

Organizer and Chairperson: **Moré, Jorge J.**, USA

**TH/4C1** **Toint, Ph. L.**, Belgium

**Tuyttens, D.**, Belgium

A New Method for Large Scale Network Programming Problems with a Nonlinear Objective Function\*

**TH/4C2** **Nocedal, Jorge**, USA

**Liu, Dong C.**, USA

Conjugate Direction Methods for Large Scale Optimization\*

**TH/4C3** **Gould, Nick I. M.**, United Kingdom

**Reid, John**, United Kingdom

A Crash Procedure for Systems of Linear Constraints\*

**TH/4C4** **Gay, David M.**, USA

**Welsch, Roy E.**, USA

Maximum Likelihood and Quasi-Likelihood for Nonlinear Exponential Family Models\*

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## **TH/4D**

### **Linear Programming III**

**TH/4D1** **Kuno, Takahito**, Japan

**Konno, Hiroshi**, Japan

Linear-Time Algorithms for Solving a Special Class of Linear Fractional Programs

**TH/4D2** **Lindberg, Per Olov**, Sweden

A Simple Theoretical Model for the Simplex Method

**TH/4D3** **Uchiyama, Tadashi**, Japan

Line Search and Moving Frame for the Linear Programming

**TH/4D4** **Sodini, Claudio**, Italy

**Cambini, Alberto**, Italy

On Parametric Linear Fractional Programs

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## **TH/4E**

### **Sensitivity Analysis in Nonlinear Programming\***

Organizer and Chairperson: **Kyparisis, Jerzy**, USA

**TH/4E1** **Kyparisis, Jerzy**, USA

Directional Differentiability of Perturbed Solutions of Nonlinear Programs\*

Thursday, September 1

- TH/4E2** **Jongen, Hubertus Th.**, FRG  
**Guddat, Jürgen**, GDR  
Structural Stability in Nonlinear Optimization\*
- TH/4E3** **Klatte, Diethard**, GDR  
**Kummer, Bernd**, GDR  
**Tammer, Klaus**, GDR  
Sensitivity of Stationary Solutions in Nonlinear Programs and Analysis of Lipschitz Continuous Mappings\*
- TH/4E4** **Matsumoto, Toshihiro**, Japan  
**Hirabayashi, Ryoichi**, Japan  
**Shindoh, Susumu**, Japan  
Local Linearization of a Feasible Region\*
- 

**TH/4F**  
**Nondifferentiable Optimization III\***

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Coorganizers: **Goffin, Jean-Louis**, Belgium  
**Fukushima, Masao**, Japan

Chairperson: **Goffin, Jean-Louis**, Belgium

- TH/4F1** **Fukushima, Masao**, Japan  
A Successive Quadratic Programming Method for a Class of Constrained Non-smooth Optimization Problems\*

- TH/4F2** **Kim, Sehun**, Korea  
**Cho, Seong-Cheol**, Korea  
Variable Target Value Subgradient Method\*

- TH/4F3** **Koh, Seokha**, Korea  
On Accelerating Convergence of the Subgradient Method\*

- TH/4F4** **Mifflin, Robert**, USA  
A Higher than First Order Method for Nonsmooth Minimization\*
- 

**TH/4G**  
**Matroid Theory II\***

---

Organizer and Chairperson: **Korte, Bernhard**, FRG

- TH/4G1** **Fujishige, Satoru**, Japan  
Optimization over the Polyhedron Determined by a Submodular Function on a Co-Intersecting Family\*
- TH/4G2** **Fukuda, Komei**, Japan  
Oriented Matroid Lattices and Shellability\*

Thursday, September 1

**TH/4G3 Bland, R. G., USA**  
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**TH/4G4 Crapo, H., France**  
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**TH/4H**  
**Travelling Salesman Problems I**

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**TH/4H1 Kataoka, Seiji, Japan**  
**Morito, Susumu, Japan**  
An Algorithm for Single Constraint Maximum Collection Problem

**TH/4H2 Yamada, Izuru, Japan**  
**Morito, Susumu, Japan**  
An Efficient Improvement Procedure for a Large-Scale Two-Dimensional Traveling Salesman Problem

**TH/4H3 Chandrasekaran, R., USA**  
**Kabadi, Santosh N., Canada**  
Gilmore-Gomory Traveling Salesman Problem

**TH/4H4 Kryński, Stanisław, Poland**  
**Libura, Marek, Poland**  
Remarks on Heuristics for the Euclidean Travelling Salesman Problem Using Space-filling Curves

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**TH/4I**  
**Integer Programming I**

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**TH/4I1 Guignard, Monique, USA**  
**Kim, Siwhan, USA**  
**Rosenwein, Moshe, USA**  
**Spielberg, Kurt, USA**  
The Potential of Lagrangian Decomposition

**TH/4I2 Nemhauser, George, USA**  
**Sigismondi, Gabrielle, USA**  
A Strong Cutting Plane Algorithm for the Node Packing Problem

**TH/4I3 Nygreen, Bjørn, Norway**  
Branch and Bound with Estimation Based on Pseudo-Shadow-Prices

Thursday, September 1

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**TH/4K**  
**Artificial Intelligence III\***

---

Organizer and Chairperson: **Hammer, Peter L.**, USA

**TH/4K1 Ibaraki, Toshihide**, Japan

Efficiency of Search Procedures for Solving Minimax Game Trees\*

**TH/4K2 Jeroslow, Robert G.**, USA

A Survey of Recent Results on Representability in Mixed Integer Programming\*

**TH/4K3 Desrochers, Martin**, Canada

**Lenstra, J. K.**, Netherlands

**Savelsbergh, M. W. P.**, Netherlands

**Stougie, L.**, Netherlands

Model and Algorithm Management for Vehicle Routing and Scheduling: A Proposal\*

**TH/4K4 Simeone, Bruno**, Italy

**Jaumard, Brigitte**, Canada

**Marchioro, Paola**, Italy

**Morgana, Aurora**, Italy

**Petreschi, Rossella**, Italy

On-Line 2-Satisfiability\*

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**TH/4L**

**Application of Mathematical Programming Techniques to the Development of Natural Resources\***

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Organizer and Chairperson: **Maculan, Nelson, Filho**, Brazil

**TH/4L1 Benchakroun, Abdelhamid**, Canada

**Cleroux, Robert**, Canada

**Ferland, Jacques A.**, Canada

Electric Power Distribution Planning\*

**TH/4L2 Nguyen, Van Hien**, Belgium

**Strodiot, Jean-Jacques**, Belgium

On a Global Maximization Problem in Diamond Industries\*

**TH/4L3 Pinto, Leontina Maria Viana Graziadio**, Brazil

**Pereira, Mário Veiga Ferraz**, Brazil

**Maculan, Nelson, Filho**, Brazil

A Model for a Hydrothermal System Expansion Planning\*

Thursday, September 1

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## TH/4M

### Mathematical Programming in Communication Network Design III

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#### TH/4M1 Kameda, Hisao, Japan

Various Levels of Individualism for Optimal Load Balancing

#### TH/4M2 Sumita, Ushio, USA

Masuda, Yasushi, USA

Dynamic Analysis of Computer Communication Systems : Linear Programming and Stochastic Analysis Approach

#### TH/4M3 Craveirinha, José, Portugal

Clímaco, João, Portugal

A Tentative Survey of Applications of Mathematical Programming to Telephone Network Planning

#### TH/4M4 Fontechea, Francisco, Japan

Onozato, Yoshikuni, Japan

Noguchi, Shoichi, Japan

On Structural Stability in Communication Networks

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## TH/4N

### Multi-Criteria Optimization IV

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#### TH/4N1 Ng, Kevin, Canada

A Goal Programming Solution Procedure for Physical Science Problems

#### TH/4N2 Baba, Norio, Japan

Two Approaches for Solving the Noise Corrupted Multiobjective Optimization Problem

#### TH/4N3 Tada, Minoru, Japan

Ishii, Hiroaki, Japan

Nishida, Toshio, Japan

Masuda, Teruo, Japan

Bi-Criteria Scheduling Problem on Uniform Processors

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## TH/4O

### Mathematical Programming in Numerical Analysis II\*

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Organizer and Chairperson: Kawahara, Mutsuto, Japan

#### TH/4O1 Tsurumi, Naoki, Japan

Kawahara, Mutsuto, Japan

Inverse Analysis of Permeability for Seepage Flow\*

**Thursday, September 1**

- TH/4O2** **Cheng, Ralph T., USA**  
**Wong, Henry F. N., USA**  
**Casulli, Vincenzo, Italy**  
A Multi-Mode Eulerian-Lagrangian Method for Unsteady Flows in a Channel Network\*
- TH/4O3** **Fukazawa, Keiji, Japan**  
**Kawahara, Mutsuto, Japan**  
Optimal Control of Structures Subjected to Earthquake Loads by Using Dynamic Programming\*
- TH/4O4** **Katopodes, Nikolaos D., USA**  
Controllability of the Flow of a Liquid Spreading on a Dry Surface\*

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**TH/4P**  
**Fuzzy Mathematical Programming IV**

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- TH/4P1** **Sinha, S. B., India**  
**Mangaraj, B. K., India**  
FGPCOMP: An Interactive Fuzzy Goal Programming Approach to Multi-Criteria-Decision-Systems
- TH/4P2** **Luhandjula, M. K., Algeria**  
Fuzzy Linear Programming : A Semi-Infinite Optimization Approach
- TH/4P3** **Li, Xiang, China**  
Analytic Tableaux Proofs in Normal Fuzzy Propositional Calculus\*
- TH/4P4** **Dumitru, Vincentiu, Rumania**  
**Luban, Florica, Rumania**  
On the Classic, Multicriteria and Fuzzy Mathematical Programming\*

**Friday, September 2**

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**FR/1A**  
**Tutorial-and-Survey Lecture VII**

---

**FR/1A1&2** **Lóvasz, László**, Hungary  
Recent Development of Number Theory and its Applications\*

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**FR/1B**  
**Variations of Newton's Method in Mathematical Programming I\***

---

Organizer and Chairperson: **Shub, Michael**, USA

**FR/1B1** **Imai, Hiroshi**, Japan  
**Iri, Masao**, Japan  
**Sasakawa, Takashi**, Japan  
Multiplicative Penalty Function Method for Linear Programming and its Variations\*

**FR/1B2** **Vial, Jean-Philippe**, Switzerland  
A Unified Approach to Projective Algorithms for Linear Programming\*

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**FR/1C**  
**Nonlinear Optimization IV**

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**FR/1C1** **Holmberg, Kaj**, Sweden  
Generalized Cross Decomposition and Variations

**FR/1C2** **Facó, João Lauro D.**, Brazil  
A Limited-Storage Quasi-Newton Reduced Gradient Algorithm for Solving Bounded Nonlinear Optimal Control Problems

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**FR/1D**  
**Numerical Methods for Solving Nonlinear Equations**

---

**FR/1D1** **Tsuchiya, Takashi**, Japan  
A Practical Error Estimate of Numerical Solutions of a System of Equations by the Fast Automatic Differentiation

**FR/1D2** **Kamiya, Kazuya**, Japan  
The Decomposition Method for Systems of Nonlinear Equations

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**FR/1H**  
**Travelling Salesman Problems II**

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**Friday, September 2**

- FR/1H1 Desrochers, Martin, Canada**  
**Lucena, Abilio, Belgium**  
On the Travelling Repairman Problem
- 

**FR/1O**  
**Nondifferentiable Optimization IV**

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- FR/1O1 Pappalardo, Massimo, Italy**  
A Necessary Optimality Condition for Non-Differentiable Constrained Extremum Problems\*
- FR/1O2 Dussault, Jean Pierre, Canada**  
**Gningue, Youssou, Canada**  
Unification of Basic and Composite Non-Differentiable Optimization
- 

**FR/2B**  
**Variations of Newton's Method in Mathematical Programming II\***

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Organizer and Chairperson: **Shub, Michael, USA**

- FR/2B1 Renegar, James, USA**  
On the Feasibility Problem for Polynomial Inequalities\*
- FR/2B2 Barnes, Earl R., USA**  
The Affine Scaling Algorithm with Centering\*
- FR/2B3 Jensen, David L., USA**  
Recursive Reduction Algorithms for Convex Quadratic Programming\*
- FR/2B4 Gonzaga, Clovis, Brazil**  
Newton Barrier Function Algorithms for Following the Central Trajectory in Linear Programming Problems\*
- 

**FR/2C**  
**Nonlinear Optimization: SQP Approach II**

---

- FR/2C1 Yamaki, Naokazu, Japan**  
**Takahashi, Satoru, Japan**  
**Yabe, Hiroshi, Japan**  
**Miyata, Masanori, Japan**  
**Hongo, Shigeru, Japan**  
Some Modifications of SQP Method for Constrained Optimization and Nonlinear Optimization Code ASNOP

**Friday, September 2**

- FR/2C2** **Panier, Eliane R., USA**  
**Tits, André L., USA**  
A Global SQP Method with Feasible Iterates
- FR/2C3** **Di Pillo, Gianni, Italy**  
**Facchinei, Francisco, Italy**  
**Grippo, Luigi, Italy**  
A RQP Algorithm Using a Differentiable Exact Penalty Function for Nonlinear Programming Problems with Inequalities
- 

**FR/2D**  
**Serial & Parallel Algorithms for Large-Scale Optimization\***

---

Organizer and Chairperson: **Mangasarian, Olvi L., USA**

- FR/2D1** **Zikan, Karel, USA**  
**Cottle, Richard W., USA**  
An Overview of the Box Method for Linear Programming\*
- FR/2D2** **Pang, Jong-Shi, USA**  
Newton's Methods for B-Differentiable Equations\*
- FR/2D3** **Subramanian, P. K., USA**  
Fixed Point Methods for the Complementarity Problem\*
- FR/2D4** **de Leone, Renato, USA**  
**Mangasarian, Olvi L., USA**  
Asynchronous Parallel Methods for Mathematical Programming\*
- 

**FR/2E**  
**Variational Inequalities II\***

---

Organizer and Chairperson: **Kyparisis, Jerzy, USA**

- FR/2E1** **Marcotte, Patrice, Canada**  
New Results on Globally Convergent Descent Methods for Monotone Variational Inequalities\*
- FR/2E2** **Gwinner, Joachim, FRG**  
Error Estimates for Monotone Variational Inequalities\*
- FR/2E3** **Nagurney, Anna, USA**  
The Computation of Large-Scale Equilibrium Problems Using Parallel and Serial Decomposition\*

Friday, September 2

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## FR/2F

### Optimization Methods for Semi-Infinite Programming Problems I\*

Coorganizers: **Kortanek, Kenneth O.**, USA

**Yamasaki, Maresugu**, Japan

Chairperson: **Kortanek, Kenneth O.**, USA

**FR/2F1** **Christiansen, E.**, Denmark

**Kortanek, Kenneth O.**, USA

On Computing Material Collapse Displacement Fields in Plastic Limit Analysis by the LP Scaling Algorithm\*

**FR/2F2** **Kawasaki, Hidefumi**, Japan

An Envelope Appearing in Semi-Infinite Programming\*

**FR/2F3** **Yamasaki, Maresugu**, Japan

Max-Flow and Min-Cut Theorems on an Infinite Network\*

**FR/2F4** **Nozawa, Ryôhei**, Japan

Max-Flow Min-Cut Theorems in a Domain\*

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## FR/2G

### Combinatorial Optimization VIII\*

Coorganizers: **Ibaraki, Toshihide**, Japan

**Oyama, Tatsuo**, Japan

Chairperson: **Oyama, Tatsuo**, Japan

**FR/2G1** **Walukiewicz, Stanisław**, Poland

Solving LP-Relaxations of the Knapsack Problem and its Generalizations\*

**FR/2G2** **Hayashi, Yoshio**, Japan

On Two-Constraint Integer Linear Programming\*

**FR/2G3** **Fischetti, Matteo**, Italy

**Toth, Paolo**, Italy

An Additive Approach for the Optimal Solution of the Prize-Collecting Travelling Salesman Problem\*

**FR/2G4** **Ciriani, Tito A.**, Italy

**Gliozzi, Stefano**, Italy

**Johnson, Ellis L.**, USA

Recent Advances in Preprocessing Techniques for Large Mixed Integer Programming Problems\*

**Friday, September 2**

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## **FR/2I** **Integer Programming II**

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**FR/2I1** **Lin, Edward Y. H.**, Canada

**Bricker, Dennis L.**, USA

An Alternate Partitioning Strategy for Special Ordered Sets Branch-and-Bound Procedure in Multiple Choice Programming

**FR/2I2** **Sharma, R. R. K.**, India

**Shukla, P. R.**, India

**Tripathy, A.**, India

Multistage Bulk Commodity Distribution : Development of Decomposition-Lagrangian Relaxation Based Algorithm\*

**FR/2I3** **Kanczashi, Tetsuya**, Japan

**Kusakari, Kimiko**, Japan

Fujitsu New Mathematical Programming System (AMPS) for Mixed Integer Programming Problems

**FR/2I4** **de Olivo, Acioli Antonio**, Brazil

**Lorena, Luiz Antonio**, Brazil

**Oliveira, Paulo Roberto**, Brazil

A Subgradient Algorithm for the Multidimensional 0-1 Knapsack Problem

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## **FR/2K** **Optimization Aspects of VLSI-Design\***

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Organizer and Chairperson: **Grötschel, Martin**, FRG

**FR/2K1** **Lengauer, Thomas**, FRG

**Wanke, Egon**, FRG

Efficient Processing of Hierarchical Circuit Designs\*

**FR/2K2** **Jünger, Michael**, FRG

**Reinelt, Gerhard**, FRG

Some Applications of Combinatorial Optimization in VLSI/PCB Layout: Models\*

**FR/2K3** **Jünger, Michael**, FRG

**Reinelt, Gerhard**, FRG

Some Applications of Combinatorial Optimization in VLSI/PCB Layout: Algorithms\*

**FR/2K4** **Leighton, Tom**, USA

**Rao, Satish**, USA

An Approximate Max-Flow Min-Cut Theorem for Uniform Multicommodity Flow Problems with Applications to Approximation Algorithms\*

**Friday, September 2**

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## **FR/2M**

### **Mathematical Programming in Production and Inventory I**

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**FR/2M1** **Nishikawa, Yoshikazu**, Japan

**Nomura, Junji**, Japan

**Sawada, Kazuya**, Japan

**Nakajima, Ryoji**, Japan

Design of a Hierarchical Multiobjective Inventory Control System\*

**FR/2M2** **Zangwill, Willard I.**, USA

Mathematical Programming Model of Just-in-Time

**FR/2M3** **Miyazaki, Shigeji**, Japan

**Sekoguchi, Kenji**, Japan

**Ohta, Hiroshi**, Japan

Scheduling for Minimizing the Total Inventory Cost for Completed Products

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## **FR/2N**

### **Multi-Criteria Optimization V**

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**FR/2N1** **Martein, Laura**, Italy

On Regularity and Lagrangian Duality in Vector Optimization

**FR/2N2** **Xing, Huiming**, China

The Decision of Saaty Scales in Judgement Matrix

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## **FR/2O**

### **Stochastic Programming V**

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**FR/2O1** **Gassmann, H. I.**, Canada

Lagrangian Techniques in Stochastic Optimization

**FR/2O2** **Matsutomi, Tatsuo**, Japan

**Ishii, Hiroaki**, Japan

**Nishida, Toshio**, Japan

Chance Constrained Round Trip Facility Location Problem in the Presence of Barriers

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## **FR/2P**

### **Mathematical Programming in Engineering**

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**Friday, September 2**

- FR/2P1** **Madsen, Kaj**, Denmark  
**Hansen, Claus Thorp**, Denmark  
**Nielsen, Hans Bruun**, Denmark  
Optimization of Pipe Networks
- FR/2P2** **Hikita, Mitsunori**, Japan  
**Nakagawa, Yuji**, Japan  
**Nakashima, Kyoichi**, Japan  
**Yamato, Kazuharu**, Japan  
Reliability Optimization of Systems by the Surrogate Constraints Algorithm with the Countermeasures to Surrogate Gaps
- FR/2P3** **Farn, Kwo-Jean**, China  
Computer Aided Layout of Petri Nets
- 

**FR/3B**  
**Interior Point Methods in Linear Programming IX\***

---

Organizer and Chairperson: **Vial, Jean-Philippe**, Switzerland

- FR/3B1** **Mizuno, Shinji**, Japan  
**Yoshise, Akiko**, Japan  
**Kikuchi, Takeshi**, Japan  
Some Numerical Experiments of Polynomial Order Algorithms for Linear Programming Problems and Linear Complementarity Problems\*
- FR/3B2** **Goffin, Jean-Louis**, Canada  
**Vial, Jean-Philippe**, Switzerland  
Cutting Planes and Column Generation Techniques with the Projective Algorithm\*
- 

**FR/3C**  
**Unconstrained Nonlinear Optimization III**

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- FR/3C1** **McCormick, Garth**, USA  
**Sofer, Ariela**, USA  
High Order Methods for Constrained Optimization: Example—Solving the Chemical Equilibrium Problem
- FR/3C2** **Barton, Russell R.**, USA  
**Ruppert, David**, USA  
**Jacobson, Sheldon**, USA  
Experiments with Simplex Search Variants
- FR/3C3** **Holman, Glen**, Canada  
(No Title)

**Friday, September 2**

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## **FR/3D Nonlinear Complementarity Problems II**

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**FR/3D1 Isac, Georges, Canada**

Hilbertian Methods in the Study of the Complementarity Problem

**FR/3D2 Yang, Jiann-Min, China**

**Chang, Tai-Sheng, China**

Semi-Asynchronous Two-stage Iterative Methods for the Symmetric Linear Complementarity Problem

**FR/3D3 Zhang, Zezeng, China**

**Wei, Jiawang, China**

The Existence and Computing of the Discrete Optimal Fixed Point on Posets

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## **FR/3E Variational Inequalities III\***

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Organizer and Chairperson: **Kyparisis, Jerzy, USA**

**FR/3E1 Dafermos, Stella, USA**

**Zhao, Lan, USA**

Variational Inequalities in General Equilibrium Analysis\*

**FR/3E2 Dafermos, Stella, USA**

**Zhao, Lan, USA**

Variational Inequalities in General Equilibrium Computation\*

**FR/3E3 Nagurney, Anna, USA**

A General Multicommodity, Intertemporal Spatial Price Equilibrium Model\*

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## **FR/3F Optimization Methods for Semi-Infinite Programming Problems II\***

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Coorganizers: **Yamasaki, Maresugu, Japan**

**Kortanek, Kenneth O., USA**

Chairperson: **Yamasaki, Maresugu, Japan**

**FR/3F1 Marin, Samuel P., USA**

**Kortanek, Kenneth O., USA**

Comments on the Solution of a Class of Semi-Infinite Programming Problems Arising in Robot Trajectory Planning\*

**FR/3F2 Todorov, Maxim Ivanov, Bulgaria**

Linear Vector Semi-Infinite Optimization : Generic Existence and Uniqueness of the Solutions\*

**Friday, September 2**

- FR/3F3** **Ferris, Michael**, USA  
**Philpott, Andrew**, New Zealand  
An Interior-Point Algorithm for Semi-Infinite Linear Programming\*

- FR/3F4** **Bird, Charles G.**, USA  
A Stochastic Programming with Recourse Approach to Capacity Planning\*

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**FR/3G**  
**Combinatorial Optimization IX\***

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Organizer: **Ibaraki, Toshihide**, Japan  
Chairperson: **Ishii, Hiroaki**, Japan

- FR/3G1** **Oyama, Tatsuo**, Japan  
Applying Apportionment Methods to Japan's House of Representative Political Constituencies
- FR/3G2** **Crama, Yves**, Netherlands  
Linearization and Concave Envelopes in Nonlinear 0-1 Programming\*

- FR/3G3** **Boros, Endre**, USA  
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Improved Roof-Duality for Quadratic 0-1 Maximization\*

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**FR/3I**  
**Integer Programming III**

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- FR/3I1** **Stoyan, Yu. G.**, USSR  
**Yakovlev, S. V.**, USSR  
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- FR/3I2** **Qiu, Hesheng**, China  
Fast Transformations for Transforming Some NP-Complete Problems into Zero-One Integer Programming Problem

- FR/3I3** **Vassilev, Vasil**, Bulgaria  
**Sgurev, Vasil**, Bulgaria  
**Genova, Krassimira**, Bulgaria  
An Algorithm of Internal Feasible Integer Directions for Pure Integer Programming Problems

- FR/3I4** **Mohan, C.**, India  
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Solution of Integer Programming Problems Using Random Search Technique for Global Optimization

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**FR/3J1** **He, Yu**, China

Downstairs Method for Finding a Global Minimizer of a Function of Several Variables\*

**FR/3J2** **He, Yu**, China

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**FR/3J3** **Goles, E.**, Chile

**Hernandez, G.**, Chile

**Matamala, M.**, Chile

Quadratic Discrete Optimization Problems Solved by Dynamical Neural Algorithms

**FR/3J4** **Bárcia, Paulo**, Portugal

Resolving Duality Gaps for Some Nonconvex Programming Problems

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**FR/3K**  
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**FR/3K2** **Chopra, Sunil**, USA

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Lower Bounds to the Area Required to Draw a Rectangular Dual

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**FR/3M2** **Sawik, Tadeusz J.**, Poland

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- FR/3N1** **Vrieze, O. J.**, Netherlands  
**Filar, J. A.**, USA  
**Schultz, T. A.**, USA  
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- FR/3N2** **Flåm, Sjur Didrik**, Norway  
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Semi-Competitive Cournot Equilibrium in Multistage Oligopolies
- FR/3N3** **Lahiri, Somdeb**, India  
A General Saddle Point Property for Two Person Variable Threat Games

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Yakovlev, S. V.	FR/3I1	Yu, Chien-Chih	WE/3N1
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Yamada, Izuru	TH/4H2	Yuan, Ya-xiang	MO/3C1
Yamaguchi, Harutoshi	MO/3O2	Zaccour, Georges	FR/3N2
Yamakawa, Eiki	MO/3O1	Zangwill, Willard I.	FR/2M2
Yamaki, Naokazu	FR/2C1	Zemel, Eitan	WE/3I1
Yamamoto, Peter	WE/2K4	Zhadan, Vitali	TH/2C2
Yamamoto, Tetsuro	TH/2A1	Zhang, Xiang-Sun	MO/3C2
Yamamoto, Yoshitsugu	TU/4E2	Zhang, Xiang-Sun	WE/2D2
Yamamoto, Yoshitsugu	TH/3A3	Zhang, Zezeng	FR/3D3
Yamasaki, Maretugu	FR/2F3	Zhao, Hangqing	TH/3N2
Yamasawa, Fumihiro	TU/2L2	Zhao, Lan	FR/3E1
Yamashita, Hiroshi	TU/1B1	Zhao, Lan	FR/3E2
Yamato, Kazuharu	FR/2P2	Zhao, Lin	TH/3I2
Yang, Jiann-Min	FR/3D2	Zheng, Quan	TH/2J2
Yang, Yaguang	WE/3N2	Zhong, Shounan	TH/3N1
Yano, Hitoshi	TU/4N2	Zhou, Zhiren	TH/3D1
Yano, Hitoshi	WE/2F2	Zhou, Zhiren	TH/3D2
Yao, Andrew Chi-Chih	WE/3K4	Zhou, Zun-Jian	TU/3M2
Yao, F. Frances	WE/4K1	Zhou, Zun-Jian	WE/2L1
Yarlagadda, R. B.	TU/4P3	Ziemba, William T.	TU/4F3
Yasuda, Keiichiro	TU/2O4	Ziemba, William T.	TU/4M1
Yi, Shang	TU/1B2	Zikan, Karel	FR/2D1
Yoshida, Minoru	TU/2M3	Zimmermann, Hans-Jürgen	WE/2F1
Yoshida, Yuji	TH/3F2	Zimmermann, Uwe	TH/4B4
Yoshikawa, Kazuhiro	TU/2F2		

**List of Organizers  
of the Specially Organized Sessions**



## List of Organizers

Birge, John R.	TU/4F	Kyparisis, Jerzy	FR/3E
Charnes, Abraham	MO/3L	Lootsma, Freerk Auke	MO/3F
Charnes, Abraham	MO/4L	Maculan, Nelson, Filho	TH/4L
Charnes, Abraham	TU/2N	Mangasarian, Olvi L.	TU/4D
Cunningham, William H.	WE/4G	Mangasarian, Olvi L.	FR/2D
Dennis, J. E., Jr.	MO/3D	Megiddo, Nimrod	MO/4B
Eaves, B. Curtis	TU/2E	Mitra, Gautam	MO/3P
Fujishige, Satoru	TH/3G	Mitra, Gautam	MO/4P
Fukushima, Masao	TH/2F	Moré, Jorge J.	TH/4C
Fukushima, Masao	TH/4F	Muto, Shigeo	MO/3N
Glover, Fred	MO/3K	Ohno, Katsuhisa	TU/3F
Goffin, Jean-Louis	TH/2F	Okabe, Atsuyuki	TH/2L
Goffin, Jean-Louis	TH/4F	Oyama, Tatsuo	FR/2G
Golany, Boaz	MO/4L	Pang, Jong-Shi	MO/3E
Goldfarb, D.	MO/3B	Pang, Jong-Shi	MO/4E
Grötschel, Martin	MO/3G	Pang, Jong-Shi	TU/3E
Grötschel, Martin	MO/4G	Phillips, Fred Y.	MO/4L
Grötschel, Martin	TU/4P	Polak, Elijan	MO/4F
Grötschel, Martin	FR/2K	Rinnooy Kan, Alexander H. G.	TU/1G
Hammer, Peter L.	TH/2K	Romanovskii, I. V.	TH/2A
Hammer, Peter L.	TH/3K	Rosen, J. B.	MO/3J
Hammer, Peter L.	TH/4K	Sawaki, Katsushige	TU/4M
Hashida, On	WE/4M	Schittkowski, K.	TH/2D
Horst, Reiner	MO/4J	Sekine, Yasuji	TU/20
Horst, Reiner	TU/2J	Sethi, Suresh	TU/3P
Ibaraki, Toshihide	TU/4H	Shikakura, Hisao	MO/40
Ibaraki, Toshihide	WE/3G	Shimizu, Kiyotaka	MO/3F
Ibaraki, Toshihide	WE/4H	Shub, Michael	FR/1B
Ibaraki, Toshihide	TH/2G	Shub, Michael	FR/2B
Ibaraki, Toshihide	FR/2G	Spedicato, Emilio	TU/1C
Ibaraki, Toshihide	FR/3G	Takenaka, Toshio	MO/30
Imai, Hiroshi	TU/4K	Talman, Dolf	WE/2E
Imai, Hiroshi	WE/2K	Tamura, Hiroyuki	TU/4L
Imai, Hiroshi	WE/3K	Tanabe, Kunio	TH/2A
Imai, Hiroshi	WE/4K	Tits, André L.	TH/2D
Jeroslow, Robert G.	TU/2G	Toint, Ph. L.	MO/4C
Jeroslow, Robert G.	TU/4G	Tomlin, John A.	WE/2A
Karmarkar, Narendra K.	TU/2B	Tone, Kaoru	TU/1B
Kawahara, Mutsuto	TH/30	Tone, Kaoru	WE/4B
Kawahara, Mutsuto	TH/40	Toyoda, Junichi	TU/20
Kawashiro, Takeo	TU/2L	Tuy, Hoang	MO/4J
Kojima, Masakazu	TU/4E	Tuy, Hoang	TU/2J
Kortanek, Kenneth O.	FR/2F	Vial, Jean-Philippe	FR/3B
Kortanek, Kenneth O.	FR/3F	Whinston, Andrew B.	MO/4K
Korte, Bernhard	WE/2G	Yamasaki, Maretsugu	FR/2F
Korte, Bernhard	TH/4G	Yamasaki, Maretsugu	FR/3F
Kusiak, Andrew	TU/3P	Zimmermann, Hans-Jürgen	WE/2F
Kyparisis, Jerzy	TH/2E	Zimmermann, Hans-Jürgen	WE/3F
Kyparisis, Jerzy	TH/4E	Zimmermann, Hans-Jürgen	WE/4F
Kyparisis, Jerzy	FR/2E		