

7th MATHEMATICAL PROGRAMMING SYMPOSIUM 1970
THE HAGUE - THE NETHERLANDS - SEPTEMBER 14 - 18

PROGRAM

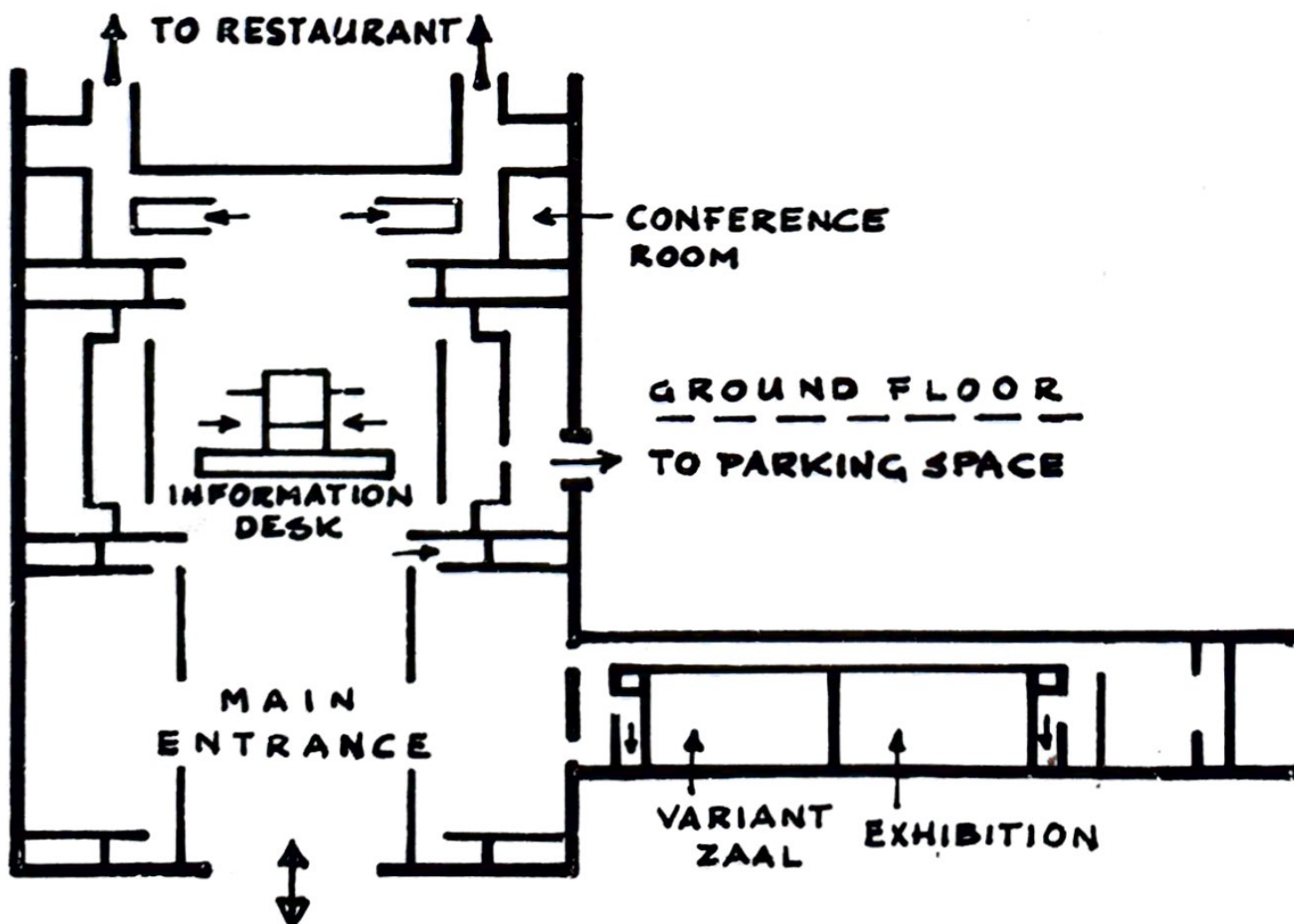
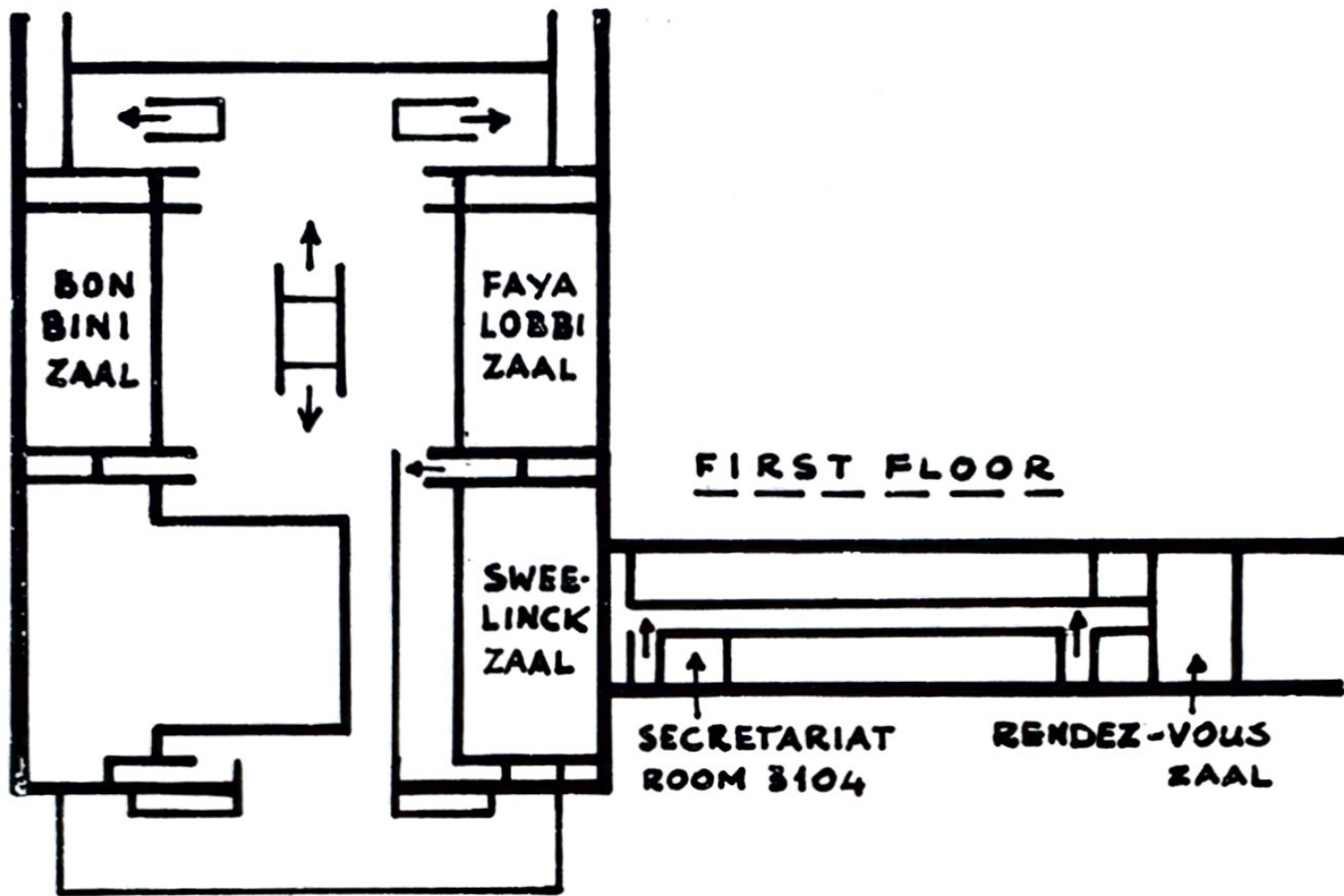


NETHERLANDS CONGRESS CENTRE, 10 CHURCHILLPLEIN, THE HAGUE



1970

NORTH-HOLLAND PUBLISHING COMPANY - AMSTERDAM



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 (for more detailed information see the leaflet in the Symposium portfolio)

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Ladies' committee:

Mrs. H. de Lange-van Raalte, chairman
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Organizing agency

Netherlands Congress Centre

Secretariat of the Symposium

A. During the Symposium:

Netherlands Congress Centre
10 Churchillplein
The Hague, The Netherlands

Telephone: (070) 51 28 51 ext. 240

Cable address: Congrescentre

Telex: 31700

The place of the secretariat is indicated on the ground-plan of the Congress Centre on page 2.

The Secretariat will be open on

Sunday, September 13, from 7.00 to 10.00 p.m.

Monday, September 14, to Friday, September 18, from 8.30 a.m. to 6.00 p.m.

B. After the Symposium:

Computing Centre, University of Leyden
20 Stationsplein
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Telephone: (01710) 48333 ext. 4131

LIST OF SPONSORS

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The Institute of Management Sciences (T.I.M.S.)

Wiskundig Genootschap (Dutch Mathematical Society)

TIME-TABLE

Registration

Sunday, September 13, 7.00 to 10.00 p.m. (Informal gathering)

Monday, September 14, 9.00 to 10.30 a.m.

Scientific sessions

From Monday, September 14, 10.30 a.m. to Friday, September 18, 4.45 p.m., in the Congress Centre.

The plenary sessions and the sessions A will always take place in the "Sweelinck-zaal"; the sessions B will be held in the "Variant-zaal" and the sessions C in the "Rendez-vous zaal". (See page 2 for a ground-plan of the Congress Centre.)

Special Meeting

Wednesday, September 16, 8.00 p.m., in the Sweelinck-zaal:

Plenary Session on founding an International Society for Mathematical Programming

Founding Committee Chairmain: *A.W. Tucker (USA)*

SIGMAP Chairman: *A. Orden (USA)*

For the past several years there has been widespread agreement among specialists in mathematical programming that it is highly desirable that a journal of mathematical programming be established. It has at the same time been generally agreed that it would be beneficial to the field to form an international society to promote and control the journal and to sustain the international symposia.

In order to initiate the journal in time for early publication of papers given at the Hague Symposium a Founding Committee composed of J. Abadie,

A.Orden, A.W.Tucker, P.Wolfe and G.Zoutendijk has been formed. This Committee has taken initial necessary steps on editorship of the journal and arrangement of a contract with a publisher. The Committee will turn over control of the journal to the officers and board of directors of the society as soon as possible.

The plenary session on founding the society is cosponsored by SIGMAP. The Executive Committee of SIGMAP has encouraged establishment of the journal and society, and has offered its full cooperation. Several ways in which SIGMAP would be able to facilitate the early stages of operation of the society will be proposed at the session.

All participants in the Symposium are invited to attend the session in order to become informed on the plans and to express their views. Decisions with regard to structure of the society, steps toward its incorporation, and election of officers have been held in abeyance until the time of this 7th Symposium. It is expected that the first election of officers and a board of directors will take place early in 1971.

(SIGMAP = Special Interest Group in Mathematical Programming of the Association for Computing Machinery (ACM).)

Special events

Monday, September 14, 6.00 p.m.: *Reception* by the Government of the Netherlands and the Municipality of The Hague in the Kurhaus Hotel, Gevers Deynootplein, Scheveningen. Buses will be available for transportation from the Congress Centre to Scheveningen.

Thursday, September 17, 7.00 p.m. for 8.00 p.m.: *Symposium dinner* in the Congress Centre.

Social program

Trips have been planned for Monday, Tuesday, Wednesday and Thursday. See page 29. Mind the blackboards for detailed information!

SCIENTIFIC PROGRAM

Prior to any session, the session chairmen will receive the corresponding speakers in the special conference room (indicated on the ground plan on page 2). The speakers are urgently requested to attend these short meetings, starting at a quarter of an hour before the session.

Monday, September 14

MORNING

10.30 a.m. to 12.30 p.m. Plenary Session (Sweelinck-zaal)

Chairman: *G.Zoutendijk (NL)*

Opening and words of welcome by the chairman

~~W~~ **G.B.Dantzig (USA)**. Large scale linear programs – a survey (**invited survey**)

~~+~~ **R.E.Gomory and E.L.Johnson (USA)**. Some continuous functions related to corner polyhedra and their applications to integer programming (**invited lecture**)

AFTERNOON

2.00 to 5.15 p.m. Session A: *Integer Programming* (Sweelinck-zaal)

Chairman: *P.L.Hammer (IL)*

J.Krarup (DK). The relationship between outerplanar graphs and a class of discrete optimization problems

I.Dragan (R). An improvement of the lexicographical algorithm for solving discrete programming problems

~~—~~ **C.Berge (F)**. Some problems of combinatorics related to mathematical programming in integers (**invited survey**)



H.Müller-Merbach (D). Approximation methods for integer programming (2 pages)

P.Bod (H). On an extremum problem concerning graphs

T.C.Hu (USA). Discrete decision tree

2.00 to 5.00 p.m. Session B: *Dynamic Programming* (Variant-zaal)

Chairman: *M.Held (USA)*

H.Bergendorff (S). An error estimate for discrete approximations of continuous state space dynamic programming



U.Bertelè and F.Brioschi (I). New development in the theory of nonserial dynamic programming

P.E.Bonzon (CAN). Combinatorial dynamic programming: a set-theoretical approach

~~**E.M.L.Beale and J.P.Vit (GB).** Selecting subsets by dynamic programming~~

N.A.J.Hastings (GB). Optimisation of Markov decision problems

(Evening, 6.00 p.m. Reception by the Government of the Netherlands and the Municipality of the Hague, Kurhaus Hotel, Scheveningen near The Hague.)

Tuesday, September 15

MORNING

9.00 a.m. to 12.30 p.m. Session A: *Non-linear Programming Theory* (Sweelinck-zaal)

Chairman: *M.J.D.Powell (GB)*

F.J.Gould and J.W.Tolle (USA). A necessary and sufficient qualification for constrained optimization

T.D.Parsons and A.W.Tucker (USA). Hybrid programs: linear and least-distance

P.Wolfe (USA). The development of the theory of non-linear programming (**invited survey**)

~~+~~ **T.O.M.Kronsjö and K.P.Wong (GB)**. Theory of decomposition of a large non-linear convex separable programme in the dual direction. Computational experience on these programmes

~~✓~~ **M.Avriel (IL)**. Non-linear programming with r-convex functions

~~✓~~ **R.Fletcher (GB)**. An efficient, globally convergent algorithm for unconstrained and linearly constrained optimization problems (**invited lecture**)

9.00 a.m. to 12.30 p.m. Session B: *Stochastic Programming* (Variant-zaal)

Chairman: *G.T. de Ghellinck (B)*

~~✓~~ **J.Stahl (H)**. On the two-stage stochastic linear programming problem

~~✓~~ **B.Bereanu (R)**. Numerical methods in stochastic linear programming

A.Prékopa (H). Programming under probabilistic constraints and programming under constraints involving conditional expectations (**invited lecture**)

P.O.Lindberg (S). Planning of transportation with stochastic production and demand

R.J.B.Wets (USA). Stochastic programming: the late 60's (invited survey)

9.00 a.m. to 12.30 p.m. Session C: *Applications* (Rendez-vous zaal)

Chairman: *M.L.Balinski (USA/F)*

S.E.Elmaghraby and M.K.Wig (USA). On the application of diophantine programming concepts to stock-cutting problems

L.D.Pyle and G.J.McWilliams (USA). On the use of the projected gradient in place of Ward's transformation in the approximate solution of two-dimensional transportation problems

A.S.Manne (USA). Numerical applications of mathematical programming to economic planning (invited survey)

J.D.Pearson (USA) and A.C. de Koninck (NL). Interchange algorithms versus multi-pass restricted optimization procedures for a large scheduling problem

W.W.G.Yeh, A.J.Askew and W.A.Hall (USA). Optimal planning and operation of a multiple purpose reservoir system

G.Graves and A.Whinston (USA). Application of mathematical programming to regional water quality management

AFTERNOON

2.00 to 5.30 p.m. Session A: *Multiple Objective Functions* (Sweelinck-zaal)

Chairman: *B.Roy (F)*

B.Roy (F). Introduction: problems and methods with multiple objective functions

A.Charnes, W.W.Cooper, M.A.Keane, E.F.Snow, A.S. Walters (USA). A mixed goal programming model for PPBS in a consumer protection regulatory agency

~~—~~ **R.Benayoun, J.de Montgolfier, J.Tergny (F), O.Laritchev (SU).** Linear programming with multiple objective functions STEP Method (STEM) (invited lecture)

+ **C.Maier-Rothe and M.F.Stankard (USA).** A linear programming approach to choosing between multi-objective alternatives

G.Boldur (R). Linear programming problems with complex decision conditions

A.Geoffrion (USA). Vector maximal decomposition programming (invited lecture)

2.00 to 5.30 p.m. Session B: *Computational Methods (SIGMAP Session)* (Variant-zaal)

Chairman: *A.C.Williams (USA)*

+ **M.M.Gutterman (USA).** Efficient implementation of a branch-and-bound algorithm

~~—~~ **E.Hellerman and D.Rarick (USA).** Reinversion with the preassigned pivot procedure

~~—~~ **A.R.Colville (USA).** Acceleration of L.P. Computations (invited lecture)

R.L.Weil and P.C.Kettler (USA). Rearranging matrices to block-angular form for decomposition (and other) algorithms

write them
~~—~~ **M.Bénichou, J.M.Gauthier, P.Girodet, G.Hentgès, G. Ribière, O.Vincent (F).** Mixed integer linear programming

~~—~~ **R.E.D.Woolsey (USA).** On telling it like it is in integer programming

L.Dekker (NL). Hybrid computation in the field of mathematical programming

2.00 to 5.30 p.m. Session C: *Panel Discussion on the Teaching of mathematical Programming* (Rendez-vous zaal)

Chairman: *M. Avriel (IL)*

The Panel consists of:

M.Avriel (IL)

J.Abadie (F)

M.L.Balinski (USA)

E.M.L.Beale (GB)

G.B.Dantzig (USA)

D.J.Wilde (USA)

Wednesday, September 16

MORNING

9.00 a.m. to 12.30 p.m. Session A: *Integer Programming/Network flow* (Sweelinck-zaal)

Chairman: *E. Balas (USA)*

S. Gorenstein (USA). An algorithm for project (job) sequencing with resource constraints

G. Mensch (USA). Single-stage linear programming zero-one solutions to some job-machine type problems

T.C. Hu (USA). The development of network flow and related areas in programming (**invited survey**)

+ **C.B. Krabek (S)**. An algorithm for the solution of the fixed charge network flow problem

P. Doulliez (B) and M.R. Rao (USA). A labeling algorithm for a multiterminal network with any one arc subject to failure

→ **M.D. Grigoriadis and W.W. White (USA)**. A partitioning algorithm for the multi-commodity network flow problem

9.00 a.m. to 12.30 p.m. Session B: *Non-linear Programming Algorithms* (Variant-zaal)

Chairman: *E.M.L. Beale (GB)*


+ **M.D. Grigoriadis (USA)**. A projective method for a class of structured non-linear programming problems #252

+ **P.M. Ghare (USA)**. Multi-step gradient methods for non-linear programming

+ **J. Abadie (F)**. Recent development of the non-linear programming algorithms (**invited survey**) ask for refs at least

sub **S.N. Afriat (USA)**. The progressive support method for convex programming


Bedoncos & Meyer
14


 **H.Pickett (USA)**. A contribution to the thaumaturgy of non-linear programming


H.Müller-Merbach (D). Separable programming using the upper bounding technique

9.00 a.m. to 12.30 p.m. Session C: *Applications* (Rendez-vous zaal)

Chairman: *S.E.Elmaghraby (USA)*

 **R.Razani (IR)**. Application of mathematical programming to optimum design of engineering structures; a survey and recent advances

 **O.Bilde (DK)**. On the solution of some road design problems

 **B.M.E. de Silva (GB)**. Optimal vibrational modes of a turbine disc

G.E.Veress, I.M.Pallai, G.A.Almásy (H). Application of dynamic programming to an industrial problem

J.L.Balintfy (USA). Mathematical programming models and techniques for optimum human diets

E.Biondi, P.Palermo and C.Pluchinotta (I). A heuristic method for a delivery problem


AFTERNOON

2.00 to 5.15 p.m. Session A: *Non-linear Programming Theory* (Sweelinck-zaal)

Chairman: *J.Abadie (F)*

S.Karamardian (USA). The complementary problem

R.Chandrasekaran (USA). A special case of the complementary pivot problem

 **R.W.Cottle (USA)**. Linear complementarity and quadratic programming (**invited survey**)

A.Majthay (H). Some remarks on non-convex quadratic programming

B.Martos (H). Sub-definite matrices and quadratic programming

J.A.Ferland (USA). Quasi-convexity and pseudo-convexity of quadratic functions

2.00 to 5.15 p.m. Session B: *Theoretical aspects of Optimization* (Variant-zaal)

Chairman: *E.L.Peterson (USA)*

M.Vlach (NL). On conditions of optimality in linear spaces

M.Bellmore and H.D.Ratcliff (USA). Set covering and involutory bases

D.R.Fulkerson (USA). Blocking and anti-blocking polyhedra (invited lecture)

A.Orden (USA). On the solution of linear equation/inequality systems

A.Berman (CAN) and A.Ben-Israel (USA). Linear inequalities, mathematical programming, and matrix theory

J.C.Fiorot (F). Some linear inequalities in Z^n

2.00 to 5.30 p.m. Session C: *Applications in Mathematics* (Rendez-vous zaal)

Chairman: *G.P.McCormick (USA)*

O.L.Mangasarian and L.L.Schumaker (USA). Discrete splines via mathematical programming

J.Céa (F). An example of an optimization problem in partial differential equations; numerical techniques and results (invited lecture)

J.B.Rosen (USA). Solution and error bound for partial differential equations by linear programming

W.Haque (CAN). A concave programming problem in function space with application in the theory of optimal foreign aid

J.W.Daniel (USA). The approximate minimization of functionals by discretization (**invited survey**)

Wednesday, September 16

EVENING

8.00 p.m. **Special SIGMAP Meeting** (Sweelinck-zaal)

Plenary Session on founding an International Society for Mathematical Programming
(for comments see page 4)

Founding Committee Chairman: *A.W.Tucker (USA)*


SIGMAP Chairman: *A.Ordern (USA)*

Thursday, September 17


MORNING


9.00 a.m. to 12.30 p.m. Session A: *Cutting Plane Methods*
(Sweelinck-zaal)


Chairman: *R.Fletcher (GB)*

 **M.A.Pollatschek and B.Avi-Itzhak (IL)**. A deep-cutting procedure for integer programming

H.Love and M.J.L.Kirby (CAN). Extreme point mathematical programming models

 **E.Balas (USA)**. The intersection cut for integer programming (**invited lecture**)

 **F.Glover (USA)**. Cut-search methods in integer programming (**invited lecture**)

 **C.Burdet (CH)**. A class of cuts and related algorithms for integer programming

D.S.Rubin and R.L.Graves (USA). The modified Dantzig cuts for integer programming

9.00 to 11.30 a.m. Session B₁: *Theory of Games* (Variant-zaal)

Chairman: *H.W.Kuhn (USA)*

B.Martinet (F). A general algorithm for an approximate solution of a game by using a dual method

H.G.Diess (I). Game theoretical solution to an aiming problem

L.J.Billera (USA). Some recent results in n-person game theory (**invited survey**)

M.J.Sobel (USA). A finite algorithm for equilibrium points of games

11.40 a.m. to 12.30 p.m. Session B₂: *Non-linear Programming Theory* (Variant-zaal)

Chairman: *F.A.Lootsma (NL)*

W.Murray (GB). An algorithm to find a local minimum of an indefinite quadratic program

C.G.Broyden and W.E.Hart (GB). A new algorithm for constrained optimisation

9.15 a.m. to 12.30 p.m. Session C: *Optimal Control* (Rendez-vous zaal)

Chairman: *H.Halkin (USA)* 9:15 Makarav continuous LP

~~D.Tabak (USA)~~. Optimal control by mathematical programming

~~D.G.Luenberger (USA)~~, Control theory and programming (invited survey)

~~K.Kapur and R.M. van Slyke (USA)~~. A cutting plane algorithm in function space with application to optimal control problems

G.L.Thompson and R.L.Weil (USA). Optimizing λ (or x) subject to $Ax = \lambda Bx$: the generalized eigenvalue problem

J.F.Croce-Spinelli (F). Remarks on some computational aspects of optimal control (invited lecture)

9:50
11 am

AFTERNOON

2.00 to 5.30 p.m. Session A: *Linear Programming* (Sweelinck-zaal)

Chairman: *Ph. Hervé (F)*

~~G.B.Dantzig and L.Tornheim (USA)~~. A linear programming algorithm for maximum change at each iteration

~~M.L.Balinski (USA)~~. A totally feasible method for linear programming

J.M.Pla (F). An "out-of-kilter" algorithm for solving minimal cost potential problems

+ **P.Gill and W.Murray (GB)**. A numerically stable form of the simplex algorithm

+ **A.C.Williams and C.Kallina (USA)**. Generalized linear programming

+ **J.Philip (S)**. Algorithms for the vector maximization problem.

2.00 to 5.30 p.m. Session B: *Non-linear Programming Theory* (Variant-zaal)

Chairman: *O.L.Mangasarian (USA)*

H.Kwakernaak and R.C.W.Strijbos (NL). Extremization of functions with equality constraints

+ **R.W.M.Sargent and B.A.Murtagh (GB)**. Projection methods for non-linear programming

+ **M.J.D.Powell (GB)**. Recent advances in unconstrained optimization (invited survey)

+ **J.Greenstadt (USA)**. Variable-metric formulas from variational principles


F.A.Lootsma (NL). Boundary properties of penalty functions for constrained minimization


G.P.McCormick (USA). Penalty function methods versus non-penalty function methods for constrained non-linear programming problems (invited survey)


2.00 to 5.30 p.m. Session C: *Various subjects* (Rendez-vous zaal)


Chairman: *T.C.Hu (USA)*


+ **G.Mitra (GB)**. Designing branch-and-bound algorithms for mathematical programming

 **M.Held and R.M.Karp (USA).** A combined ascent and branch-and-bound algorithm for the travelling salesman problem

 **P.D.Krolak, W.Felts and G.Marble (USA).** Heuristics for solving the travelling salesman problem and various related scheduling problems

 **K.G.Murty (USA).** A fundamental problem in linear inequalities with applications to the travelling salesman problem

 **Miss M.Guignard (F) and K. Spielberg (USA).** The state enumeration method for mixed zero-one programming

 **R.Schinzinger (USA).** On the reduction of the continuous variable component in mixed integer linear programming

(Evening, 7.00 p.m. Symposium dinner in the Netherlands Congress Centre.)

Friday, September 18

MORNING

9.00 a.m. to 12.30 p.m. Session A: *Non-linear Programming Theory* (Sweelinck-zaal)

Chairman: *R. W.M. Sargent (GB)*

Researching for NLP - general alg.

+ **M.J. Beckman (D) and K.C. Kapur (USA)**. On duality and conjugacy in non-linear programming, and some applications

— **E.L. Peterson (USA)**. Symmetric duality in convex programming and its economic interpretation

+ **R.T. Rockafellar (USA)**. New applications of duality in convex programming (invited lecture)

L. Hellinckx and M. Rijckaert (B). A solution procedure for geometric programming problems with degrees of difficulty

U. Passy (IL). Generalized weighted mean programming

A.J. Federowicz (USA). Asymptotic and approximate analytic solutions to geometric programming problems

9.00 a.m. to 12.30 p.m. Session B: *Integer Programming* (Variant-zaal)

Chairman: *H. Müller-Merbach (D)*

P. Robillard and M. Florian (CAN). (0,1) Hyperbolic programming problems

* **P. Hansen (B)**. Non-linear 0-1 programming by implicit enumeration

— variant - 2 parts of IP

R. Cruon (F). Tree-search methods for discrete programming (invited lecture)

D.J. Wilde (USA) and J.M. Sanchez-Anton (E). Discrete optimization on a multivariate Boolean lattice

P.L.Hammer and U.N.Peled (IL). On the maximization of a pseudo-Boolean function

Miss F.Granot (CAN) and P.L.Hammer (IL). On the use of Boolean equations in bivalent programming

L.B.Kovács (H). An algorithm for the solution of an integer programming problem by dynamic programming

9.30 a.m. to 12.30 p.m. Session C: *Large Scale Systems/Applications* (Rendex-vous zaal)

Chairman: ...

+ 19 - Dekker -

F.Giannessi (I). A gradual algorithm for the resolution of linear programming problems of large scale

+ **R.B.Stanfield (USA).** Non-linear programming in large models

inland - ship routing
T.A.J.Nicholson and R.D.Pullen (GB). An inlet-control system for multi-stage sequencing

N.Buras (IL). Investment scheduling in the development of water resources

+ **L.Appelgren (S).** Computational experience of a vessel scheduling algorithm using column generation and branch-and-bound techniques

AFTERNOON

2.00 to 3.15 p.m. Session A: *Integer Programming* (Sweelinck-zaal)

Chairman: *A.Prékopa (H)*

S.Rudeanu (R). Recent advances in pseudo-Boolean programming (**invited lecture**)

+ **M.Gondran (F).** Nonlinear integer programming

2.00 to 3.30 p.m. Session B: *Various Subjects* (Variant-zaal)

Chairman: *J.L.Balintfy (USA)*

G.Kéri (H). A modified stepping-stone algorithm for the transportation problem

I.M.Stancu-Minasian (R). The solution of a transportation network in the case of multiple criteria

J.N.Kapur (IND). Mathematical programming research in India

3.50 to 4.45 p.m. Plenary session (Sweelinck-zaal)

Chairman: *J.F.Benders (NL)*

H.W.Kuhn (USA). The future of mathematical programming (invited lecture)

Closing words by the session chairman

GENERAL INFORMATION

Secretariat of the Symposium, registration/information desk

During Symposium the Secretariat and the Information Desk at the Congress Centre will be open:

Sunday, September 13, from 7.00 to 10.00 p.m.;
Monday, September 14, to Friday, September 18,
from 8.30 a.m. to 6.00 p.m.

Pigeon holes

At the Information Desk each participant has a private pigeon hole (corresponding to his Symposium number). New information and personal mail will be placed in the pigeon holes daily. It cannot be too strongly emphasized that the participant should visit the Secretariat frequently for this reason.

Badges

All participants are kindly requested to wear their white badge in clear view. The members of the Organizing Committee will wear a red badge.

Conference room

As indicated on the ground plan on page 2, there is a room in the Congress Centre available for incidental conference meetings. This room will also be used for short meetings prior to any session, as mentioned on page 8.

Banking facilities

A banking agency is situated in the shopping centre of the Netherlands Congress Centre. Opening hours: Monday, September 14, until Friday, September 18, from 10.30 a.m. — 1.00 p.m. This office will give all currency information needed.

Post office

There is a post office in the Netherlands Congress Centre. Opening hours: Monday, September 14, until Friday, September 18, from 9.00 a.m. – 2.00 p.m. The Symposium information portfolio contains a leaflet giving mail rates all over the world.

Catering services

The restaurant of the Netherlands Congress Centre offers a quick service counter and a menu à la carte, Monday excepted. Further, the “Faya Lobbi zaal” (see page 2) is open, to symposium participants only, for self-service lunch at reduced prices.

Coffee and tea

In the breaks during the sessions coffee and tea will be served free of charge.

Tips

Prices in the Netherlands include service and tax.

Parking

Adequate parking space is available at the Netherlands Congress Centre. Special congress parking reduction tickets can be obtained at the desk. When handed in together with the ordinary ticket, such a reduction ticket will provide the participants with the special congress rate of Dfl. 1.50 for any morning, afternoon or evening period.

Taxis

Taxis are available at the various taxi ranks in The Hague or can be ordered at the central taxi service: tel. 90 77 22. Tips are included in the taxi fees.

Transportation

The tramway lines, nrs. 8 and 10 can be used for transportation between the Congress Centre, the city centre of The Hague, and the railway station on the Amsterdam-Rotterdam line ("Hollandse Spoor Station"). Nrs. 8, 9 and 11 can be taken from the city to the North Sea beach, nrs. 8 and 9 reaching the "Kurhaus" at Scheveningen. The bus line nr. 4 connects the Congress Centre with the railway station on the Utrecht line ("Staatspoor Station"), bus nr. 14 with the "Kurhaus".

Trains leave The Hague approx. every 15 minutes for Rotterdam and Amsterdam, 20 minutes and 45 minutes travelling respectively; every 30 minutes for Utrecht, about 50 minutes travelling.

There is a coach service to Schiphol Airport from the KLM Royal Dutch Airlines Terminal (see map on page 32). Coaches leave the Hague at the following times, arriving at Schiphol Airport 45 min. later (Mind the time needed for check-in!). The fare is Dfl. 4.75 for adults.

a.m.: 5.40 (not on Tuesday, Wednesday, Thursday)

6.00 – 6.45 – 7.00 – 7.15 – 7.35 – 8.00 – 8.35 a.m.;

from 9.00 a.m. until 5.00 p.m.: every .00 and .30;

p.m.: 5.40 – 6.20 – 7.00 – 7.40 – 8.20 – 9.00 – 9.30 – 10.00 –
10.30 p.m.

Ladies program

The Ladies' Hospitality Committee "Den Haag Ontvangt" (a voluntary and permanent committee for entertaining ladies coming from abroad) has prepared some excursions which promise to be pleasant and interesting. (see p. 29).

Liability

The Organizing Committee and the Netherlands Congress Centre cannot accept responsibility for any accident, loss of life, illness, thefts or loss of possessions sustained by participants of the Symposium or their families while in transit to and from the Symposium or while staying in the Netherlands in connection with it.

Exhibition

During the Symposium there will be an exhibition of computing equipment and of scientific literature, in the Netherlands Congress Centre. This exhibition is open daily from 8.30 a.m. until 6.00 p.m.

List of exhibitors

Control Data
Elsevier Publishing Company
North-Holland Publishing Company
Olivetti-Ivrea
Springer-Verlag
Staalmeubel N.V.
Stichting Mathematisch Centrum
Univac

SOCIAL PROGRAM

(All buses will leave from and return at the "Kurhaus", Gevers Deynootplein, Scheveningen.)

SUNDAY, September 13

Participants and accompanying persons

There will be an informal gathering in the Congress Centre during the first registration period from 7.00 until 10.00 p.m.

MONDAY, September 14

Accompanying persons

2.00 to 5.00 p.m.

Tour by bus through The Hague and surroundings with a tea-break (Dfl. 7.50). This tour will give a general impression of the town where you are staying during the Symposium. Especially noteworthy are the beautiful public gardens of The Hague

Participants and accompanying persons

6.00 p.m.

Reception by the Government of the Netherlands and the Municipality of The Hague in the Kurhaushotel.

TUESDAY, September 15

Accompanying persons

11.00 a.m.

Watching "Prinsjesdag" (Little Prince's Day). This "Third Tuesday of September" is the traditional standard date for the annual opening of the Dutch Parliament, which is accompanied by one of the very rare outbursts of pageantry in the Netherlands: a short

procession surrounding the "Gilded Carriage" which the Queen uses to drive to the Parliament buildings. It is possible to watch this festive procession by reserving a seat in front of the "Maurits-huis" at the Information desk for Dfl. 3.--.

Accompanying persons

3.00 to 6.00 p.m.

Visit by bus to Leyden. Further details will be announced during the Symposium.

WEDNESDAY, September 16

Accompanying persons

9.00 a.m. to 5.00 p.m.

Excursion by bus to the flower auction in Aalsmeer and to Amsterdam (Dfl. 30.--, luncheon included).

Amsterdam, bounded by concentric canals, is a city-within-a-city. A heritage – greatest of its kind in Europe – of a golden age. 5000 of the houses that line the quaysides and many of the 635 bridges are national monuments. They recall the 17th and 18th centuries when Amsterdam was world centre of trade and transport, when arts and sciences flourished and incredible fortunes were made and lost.

A boattrip through the canals (the best way to get acquainted with the beauty of old Amsterdam) will be made after a visit to the Rijksmuseum with its famous collection of Dutch paintings (Rembrandt, Vermeer, Hobbema, Frans Hals and Jan Steen).

A visit to a diamond factory has been scheduled. Luncheon will be served at the Apollo-pavillon, Apollolaan 2, at 1.00 p.m.

THURSDAY, September 17

Accompanying persons

9.00 a.m. to 1.00 p.m.

Excursion by bus to Gouda (Dfl. 7.50)

In the Market Square at Gouda the 15th century Gothic Town Hall and the Weigh House, built in 1668 are outstanding specimens of Dutch architecture.

A visit will be paid to St. Jan's Church (15th century) with its famous windows, made between 1555 and 1603, and magnificent organ.

Participants and accompanying persons

Symposium dinner in the Netherlands Congress Centre, beginning at 8.00 p.m. An apéritif will precede the dinner, starting at 7.00 p.m. Informal dress.

The participants who did not yet subscribe to the dinner can obtain tickets at the Information desk. The price is Dfl. 35,- per person (all in).

