



Research Workshop

of the

הקרן הלאומית למדע

מיסודה של האקדמיה הלאומית הישראלית למדעים

ISRAEL SCIENCE FOUNDATION

founded by the Israel Academy of Sciences and Humanities

on

*Inherently Parallel Algorithms in Feasibility
and Optimization and their Applications*

13-16 March, 2000

Haifa, Israel

with support from the

Institute of Advanced Studies in Mathematics
Technion--Israel Institute of Technology

Research Authority
and
Faculty of Social and Mathematical Sciences
University of Haifa

and the

Israel Mathematical Union

Scientific Committee : Lev Bregman (Beer-Sheba, Israel), Dan Butnariu (Haifa, Israel), Yair Censor (Haifa, Israel), Tommy Elfving (Linköping, Sweden), Gabor Herman (Philadelphia, U.S.A.), Alfredo Iusem (Rio de Janeiro, Brazil), Simeon Reich (Haifa, Israel) and Stavros Zenios (Nicosia, Cyprus)

Organizers : D. Butnariu (University of Haifa), Y. Censor (University of Haifa) and S. Reich (Technion)

List of Participants

Yakov Alber (Israel)
Alfred Auslender (France)
Heinz Bauschke (Canada)
Adi Ben-Israel (U.S.A.)
Aharon Ben-Tal (Israel)
Dimitri Bertsekas (U.S.A.)
Jonathan Borwein (Canada)
Lev Bregman (Israel)

Dan Butnariu (Israel)
Charles Byrne (U.S.A.)
Yair Censor (Israel)
Patrick Combettes (France)
Gilbert Crombez (Belgium)
Imre Csiszar (Hungary)
Achiya Dax (Israel)
Alvaro De Pierro (Brazil)
Frank Deutsch (U.S.A.)
Paul Eggermont (U.S.A.)
Sjur Didrik Flam (Norway)
Ubaldo Garcia Palomares (Venezuela)
Gabor Herman (U.S.A.)
Hein Hundal (U.S.A.)
Alfredo Noel Iusem (Brazil)
Krzysztof Kiwiel (Poland)
Zuhair Nashed (U.S.A.)
Frank Natterer (Germany)
Arkadi Nemirovski (Israel)
Boris Polyak (Russia)
Simeon Reich (Israel)
Yousef Saad (U.S.A.)
Hugo Scolnik (Argentina)
Mikhail Solodov (Brazil)
Kunio Tanabe (Japan)
Marc Teboulle (Israel)
Michel Thera (France)
Paul Tseng (U.S.A.)
Isao Yamada (Japan)
Stavros Zenios (Cyprus)

Program

Monday, 13 March
Location: University of Haifa
Eshkol Tower Building
Senate Room, 29th Floor

08:30-08:50 Registration


Morning session

Chair: Adi Ben-Israel (Piscataway, New Jersey)

08:50-09:00 Greetings by Professor Gad Gilbar,
Rector of the University of Haifa

09:00-09:40 **Alfredo Noel Iusem** (Rio de Janeiro, Brazil)
Projection Algorithms for the Abstract Equilibrium Problem

09:50-10:30 **Marc Teboulle** (Tel Aviv, Israel)
Duality and Lagrangian Methods for Variational Inequalities

10:30-11:00 

11:00-11:40 **Achiya Dax** (Jerusalem, Israel)
The Adventures of a Simple Algorithm

11:50-12:30 **Michel Thera** (Limoges, France)
Finding a Zero of the Extended Sum of Maximal Monotone Operators


Afternoon session

Chair: **Charles Byrne** (Lowell, Massachusetts)

14:00-14:40 **Heinz Bauschke** (Kelowna, British Columbia)
Projection Algorithms: Some Results and Open Problems

14:50-15:30 **Gabor T. Herman** (Philadelphia, Pennsylvania)
Parallel Algebraic Reconstruction Techniques for Helical Cone-Beam Tomography

15:40-16:20 **Alfred Auslender** (Paris, France)
Entropic Proximal Decomposition Methods for Convex Programs and Variational Inequalities

16:20-16:50 

16:50-17:30 **Sjur Didrik Flam** (Bergen, Norway)
Noncooperative Games and Newton's Method

17:40-18:20 **Krzysztof C. Kiwiel** (Warsaw, Poland)
Parallel Subgradient Methods for Convex Optimization


Tuesday, 14 March
Location: **University of Haifa**
Eshkol Tower Building
Senate Room, 29th Floor

Morning session

Chair: **M. Zuhair Nashed** (Newark, Delaware)

09:00-09:40 **Jonathan M. Borwein** (Burnaby, British Columbia)
Parallel Symbolic Computation: Methods and Issues

09:50-10:30 **Stavros A. Zenios** (Nicosia, Cyprus)
Scenarios in Financial Planning and the Role of Mathematical Programming and Parallel Computing

10:30-10:50 

10:50-11:30 **Frank Natterer** (Muenster, Germany)
The Kaczmarz Method in Nonlinear Imaging

11:40-12:20 **Patrick L. Combettes** (Paris, France)
Structure and Convergence of Some Block-Iterative Parallel Constraint Disintegration Methods


12:30-13:10 **Yakov I. Alber** (Haifa, Israel)
On Average Convergence and Stability of Iterative Projection Methods for Variational Inequalities and Optimization Problems

Afternoon session

Chair: **Patrick L. Combettes** (Paris, France)

14:30-15:10 **Dimitri P. Bertsekas** (Cambridge, Massachusetts)
Incremental and Parallel Subgradient Methods

15:20-16:00 **Paul Tseng** (Seattle, Washington)
On the EM Algorithm: Interpretations, Analysis and Generalizations

16:00-16:30 

16:30-17:10 **Aharon Ben-Tal** and **Arkadi Nemirovski** (Haifa, Israel)
Convex Optimization in Nuclear Tomography

17:20-18:00 **Kunio Tanabe** (Tokyo, Japan)
To be announced

18:00-19:00 A guided tour of the Hecht Archeological Museum at the University of Haifa



19:30-22:00 Banquet in the Outlook Hall

Wednesday, 15 March

Location: Technion-Israel Institute of Technology
Amado Mathematics Building
Room 232


Morning session

Chair: **Boris Polyak** (Moscow, Russia)

08:30-09:10 **Mikhail V. Solodov** (Rio de Janeiro, Brazil)
Parallel Variable Distribution in Optimization

09:20-10:00 **Charles Byrne** (Lowell, Massachusetts)
Iterative Projection onto Convex Sets Using Multiple Bregman Distances

10:10-11:00 **Yousef Saad** (Minneapolis, Minnesota)
Recent Developments in Parallel Iterative Solution Methods for Sparse Linear Systems

11:00-11:30 

11:30-12:20 **Gilbert Crombez** (Ghent, Belgium)
Improving the Speed of Convergence in POCS by Allowing Non-Monotonous Approximation

12:20-13:00 **M. Zuhair Nashed** (Newark, Delaware)
A New Generation of Newton-Like Methods: Nonsmooth and Ill-Posed Problems

Afternoon



13:10 Excursion to Acre

Thursday, 16 March
Location: Technion-Israel Institute of Technology
Amado Mathematics Building
Room 232


Morning session

Chair: Frank Deutsch (University Park, Pennsylvania)

08:50-09:30 **Imre Csiszar** (Budapest, Hungary)
Convex Reconstruction Methods and Maximum Entropy on the Mean

09:40-10:20 **Paul P.B. Eggermont** (Newark, Delaware)
On the Smallest Ball Containing the Intersection of Two Ellipsoids: Approximations and Applications

10:30-11:10 **Alvaro R. De Pierro** (Campinas, Brazil)
From Sequential Algorithms to Parallel Ones and Vice Versa

11:10-11:40 

11:40-12:20 **Isao Yamada** (Tokyo, Japan)
The Hybrid Steepest Descent Method for the Variational Inequality Problem over the Fixed Point Set of a Nonexpansive Mapping

12:30-13:10 **Ubaldo M. Garcia Palomares** (Caracas, Venezuela)
Parallel Conjugate-Gradient Methods for Solving the Convex Inequality Problem

13:20-14:00 **Hugo Scolnik** (Buenos Aires, Argentina)
New Optimized and Accelerated PAM Methods for Solving Large Non-Symmetric Linear Systems: Theory and Practice


Afternoon session

Chair: Sjur Didrik Flam (Bergen, Norway)

15:30-16:10 **Frank Deutsch** (University Park, Pennsylvania)
Accelerating the Method of Alternating Projections

Hein Hundal (State College, Pennsylvania)
Compact Operators as Products of Projections

16:20-17:00 **Boris T. Polyak** (Moscow, Russia)
Random Algorithms for Projections in Feasible and Infeasible Cases

17:00-17:30 

17:30-18:10 **Adi Ben-Israel** (Piscataway, New Jersey)
Directional Newton & Newton-Like Methods in N Variables

18:20-19:00 **Lev Bregman** (Beer-Sheba, Israel)
A Parallel Algorithm for Resource Allocation Games