Contents

Greetings and foreword ............................................................ vi
Technical Program Co-Chairs’ Message ....................................... viii
Organizing Committee .............................................................. ix
Technical Program Committee .................................................... x
Advisory Committee ............................................................... xi
NOLTA Steering Committee ......................................................... xi
Special Session Steering Organizers ............................................ xii
Symposium Information ........................................................... xiii
  Symposium Venue .................................................................. xiii
  Social Events ....................................................................... xiii
Session at a Glance .................................................................. xiv

Technical Program .................................................................. xvii
A1L-B Complex Networks and Systems I ........................................ xvii
A1L-C (S) Intelligent Robotics .................................................... xvii
A1L-D Image and Signal Processing I ........................................... xviii
A1L-E Applied Mathematics ...................................................... xviii
A1L-F Optimization I ............................................................... xix
A2L-B (S) Applications of Complex Networks I: Constructing Networks from Observed Data .............................................. xix
A2L-C (S) Nonlinear Spatial-Temporal Logic via Cellular Wave Computers I .......................................................... xx
A2L-D Image and Signal Processing II .......................................... xxi
A2L-E Chaos and Bifurcation I .................................................... xxi
A2L-F Optimization II ............................................................... xxi
A3L-B (S) Applications of Complex Networks II: Algorithms and Applications .......................................................... xxii
A3L-C (S) Nonlinear Spatial-Temporal Logic via Cellular Wave Computers II ..................................................... xxiii
A3L-D Image and Signal Processing III ......................................... xxiii
A3L-E Chaos and Bifurcation II ................................................... xxiv
A3L-F (S) Optimization through Nonlinear Dynamics .................. xxiv
A4L-A Inaugural Talk ................................................................. xxv
B1L-A Plenary Talk 1 ................................................................. xxv
B2L-B Complex Networks and Systems II .................................... xxv
B2L-C Learning and Memory ...................................................... xxvi
B2L-E Chaos and Bifurcation III .................................................. xxvii
B2L-F Control I ........................................................................ xxvii
B3L-B (S) Nonlinear Time Series Analysis I: Spatially Extended Systems State Estimation .................................................. xxviii
B3L-C (S) Nonlinear Behavior Caused by Switching Dynamics I .......................................................... xxviii
B3L-D Modeling and Simulation .................................................. xxix
B3L-E Chaos and Bifurcation IV ................................................... xxx
B3L-F Control II and Fuzzy ......................................................... xxx
B4L-B (S) Nonlinear Time Series Analysis II: Stochastic Models and Statistical Methods .................................................. xxxi
2008 International Symposium on Nonlinear Theory and its Applications

Danubius Health Spa Resort Helia, Budapest, Republic of Hungary, September 7-10, 2008.

Organizer:
Research Society of Nonlinear Theory and its Applications, IEICE

In Cooperation with:
Technical Group on Nonlinear Problems, IEICE
Technical Group on Circuits and Systems, IEICE
IEEE Circuits and Systems Society
IEEE Hungary Section
IEEE Hungary Circuits, Systems and Computer Joint Chapter
Greetings and foreword

On behalf of the Organizing Committee, we are sincerely welcome you to Budapest and to the 2008 International Symposium on Nonlinear Theory and its Applications (NOLTA2008). This is the 18th NOLTA Symposium sponsored by the Research Society of Nonlinear Theory and its Applications, IEICE, and more recently, by the Circuits and Systems Society, IEEE. Since its foundation, NOLTA has been held in Japan, USA, Switzerland, Germany, China, Belgium, Italy and Canada. We consider a great honor and privilege to organize the NOLTA2008 in Budapest, Hungary, and offer you a taste of Hungarian hospitality.

For many centuries Hungary was the main battle zone between the East and West, both of them had a very strong influence on her culture and history. The Austrian-Hungarian Monarchy was a melting pot of many Central European nations, the close interactions among these nations resulted in a very reach and special culture that makes Hungary and Budapest very special and different from the other European countries and towns. Hungary is world-renowned for its history, arts and culture. Budapest, featuring the banks of Danube, the Buda Castle and Andrásy Avenue were selected as world heritage in 1987. Budapest has many Japanese connections, for example, it is a sister city of Osaka. It is a great honor for us to host NOLTA2008 in Budapest. The Hungarian capital Budapest is arguably one of the most beautiful cities in the world.

The main feature of the NOLTA2008 Symposium is its technical program offering invited lectures, regular papers and special sessions. We would like to thank the Technical Program Co-Chairs, Prof. Yoshihiko Horio (Tokyo Denki University) and Prof. Gábor Péceli (Budapest University of Technology and Economics) for putting together such an excellent technical program, the Special Sessions Co-Chairs, Prof. Koji Nakajima (Tohoku University) and Prof. Tamás Roska (Peter Pázmány Catholic University) for selecting and organizing such valuable special sessions. Special thanks go out to the Technical Program Committee Members and reviewers for their dedicated service. We would also like to thank the keynote speakers and session co-chairs for their fine contributions to the technical program. Especially, we would like to thank Prof. Leon Chua (University of California at Berkeley) his exciting inaugural talk on the discovery of missing circuit elements, the memristor. Last but not least we would like to thank all the authors for their excellent contributions, without their efforts NOLTA2008 might never have been a success.

The NOLTA2008 Symposium would not be possible without the endless help and dedication of the members of the Symposium Organization Committee, including the Publication Co-Chairs, Finance Chair, Publicity Co-Chairs, Technical Program Secretary, System Administration, Local Arrangement and, above all, the General Co-Secretary, Ken’ya Jinno. A special thank goes to Mr. Tamás Krébesz (PhD student, Budapest University of Technology and Economics) who has worked a lot to make NOLTA2008 a full success.
Thanks for participating in the work of NOLTA2008 Symposium. We encourage you to take the full advantage of this ultimate event, one of the world leading symposiums devoted to nonlinear theory and its applications. We do hope you will have fruitful discussions at the Symposium and that your stay in Budapest will be both rewarding and memorable.

Géza Kolumbán  
Tetsuro Endo  
General Co-Chairs, NOLTA2008
Technical Program Co-Chairs’ Message

On behalf of the Technical Program Committee, we are delighted to welcome all of you to the International Symposium on Nonlinear Theory and Its Applications. NOLTA2008’s technical program covers topics in a variety of areas of nonlinear circuits and theory, bifurcation and chaos, design and analysis of nonlinear oscillators, neural networks, circuits and systems, complex systems, control and robotics, time series analysis, and so on. We are confident that the attendees will enjoy the technical program. In total, 193 papers including 77 special session papers are scheduled for presentations in 44 sessions. These papers were submitted from 22 countries from the world. NOLTA2008 also features three exiting plenary talks. Topics of the plenary talks are: “The Missing Memristor Found” by Prof. Leon Chua (University of California, Berkeley), “Known and Unknown Phenomena of Nonlinear Behaviors in the Power Harvesting Mat and the Transverse Wave Speaker” by Prof. Yoshiyasu Takefuji (Keio University), and “Potpourri of Applications of Complex Networks Research” by Prof. Chi K. Tse (Hong Kong Polytechnic University). We are pleased to have these speakers presenting their latest research topics. We would like to offer special thanks to the reviewers, the Technical Program Committee, consisting 50 Committee Members, the Special Session Co-Chairs, the organizers of Special Sessions, for their dedicated services. We also would like to thank the session chairs for their fine contributions to the technical program. Finally, our sincere thanks also go to the all authors for their excellent contributions and participation in NOLTA2008. Thank you very much for all of the participants. We really hope that all of you enjoy the fruitful technical discussions in Budapest.

Yoshihiko Horio  Gábor Péceli
Technical Program Co-Chairs, NOLTA 2008
Organizing Committee

General Co-Chairs

Géza Kolumbán
Budapest University of Tech. and Economics

Tetsuro Endo
Meiji University

Technical Program Co-Chairs

Yoshihiko Horio
Tokyo Denki University

Gábor Péceli
Budapest University of Tech. and Economics

Special Session Co-Chairs

Tamás Roska
Pázmány University

Koji Nakajima
Tohoku University

Publications Co-Chairs

Chi Kong Tse
Hong Kong Polytechnic University

Tohru Ikeguchi
Saitama University

Finance Chair

Hiroomi Hikawa
Kansai University

Publicity Co-Chairs

Laszlo Abraham
National Instruments Europe Kft.

Takuji Kousaka
Oita University

Local Arrangement Chair

Gabor Toth
Ot Evszak Kft.

Publication Secretary

Tetsushi Ueta
Tokushima University

General Co-Secretaries

Francis C. M. Lau
Hong Kong Polytechnic University

Kenya Jinno
ERATO-JST
Technical Program Committee

Technical Program Co-Chairs

Yoshihiko Horio (Tokyo Denki Univ.)  Gábor Péceli (Budapest Univ. Tech. & Econ.)

Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masaharu Adachi</td>
<td>Tokyo Denki Univ.</td>
</tr>
<tr>
<td>Shinji Doi (Osaka Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yasunori Endo (Univ. Tsukuba)</td>
<td></td>
</tr>
<tr>
<td>Luigi Fortuna (Univ. Catania)</td>
<td></td>
</tr>
<tr>
<td>Mikio Hasegawa (Science Univ. Tokyo)</td>
<td></td>
</tr>
<tr>
<td>Daniel Hillier (Frideric Miescher Inst., Basel)</td>
<td></td>
</tr>
<tr>
<td>Kazushi Ikeda (Kyoto Univ.)</td>
<td></td>
</tr>
<tr>
<td>Wolfram Just (Chemnitz Univ. Tech.)</td>
<td></td>
</tr>
<tr>
<td>Michael P. Kennedy (Univ. College Cork)</td>
<td></td>
</tr>
<tr>
<td>Keiji Konishi (Osaka Prefecture Univ.)</td>
<td></td>
</tr>
<tr>
<td>Francis Lau (Hong Kong Polytechnic Univ.)</td>
<td></td>
</tr>
<tr>
<td>Gianluca Mazzini (Bologna Univ.)</td>
<td></td>
</tr>
<tr>
<td>Takashi Morie (Kyushu Inst. Tech.)</td>
<td></td>
</tr>
<tr>
<td>Hiroyo Nakao (Kyoto Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yoshifumi Nishio (Tokushima Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yasutada Oohama (Tokushima Univ.)</td>
<td></td>
</tr>
<tr>
<td>Katsutoshi Saeki (Nihon Univ.)</td>
<td></td>
</tr>
<tr>
<td>Wolfgang Schwarz (Tech. Univ. Dresden)</td>
<td></td>
</tr>
<tr>
<td>Gianluca Setti (Univ. Ferrara)</td>
<td></td>
</tr>
<tr>
<td>Peter Szolgay (Pazmany Chatolic Univ.)</td>
<td></td>
</tr>
<tr>
<td>Hajime Takakubo (Chuo Univ.)</td>
<td></td>
</tr>
<tr>
<td>Kazuko Terada (Toho Univ.)</td>
<td></td>
</tr>
<tr>
<td>Isao Tokuda (JAIST)</td>
<td></td>
</tr>
<tr>
<td>Chi K. Tse (Hong Kong Polytechnic Univ.)</td>
<td></td>
</tr>
<tr>
<td>Atsushi Uchida (Saitama Univ.)</td>
<td></td>
</tr>
<tr>
<td>Takashi Yasuno (Tokushima Univ.)</td>
<td></td>
</tr>
<tr>
<td>Pascal Charge (INSA Toulouse)</td>
<td></td>
</tr>
<tr>
<td>Octavian Dranga (James Cook Univ.)</td>
<td></td>
</tr>
<tr>
<td>Orla Feely (Univ. College Dublin)</td>
<td></td>
</tr>
<tr>
<td>Danièle Fournier-Prunaret (INSA Toulouse)</td>
<td></td>
</tr>
<tr>
<td>Martin Hasler (EPFL)</td>
<td></td>
</tr>
<tr>
<td>Takashi Hisakado (Kyoto Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yasuaki Inoue (Waseda Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yuchi Kanzawa (Sibaura Institute Tech.)</td>
<td></td>
</tr>
<tr>
<td>Ljupco Kocarev (Univ. California, San Diego)</td>
<td></td>
</tr>
<tr>
<td>Masamitsu Kurisu (Tokyo Denki Univ.)</td>
<td></td>
</tr>
<tr>
<td>Akio Matsumoto (Chuo Univ.)</td>
<td></td>
</tr>
<tr>
<td>Takaya Miyano (Ritsumeikan Univ.)</td>
<td></td>
</tr>
<tr>
<td>Hiroyuki Nakajima (Kinki Univ.)</td>
<td></td>
</tr>
<tr>
<td>Kiyohisa Natsume (Kyushu Inst. Tech.)</td>
<td></td>
</tr>
<tr>
<td>Maciej Ogorzalek (Jagiellonian Univ.)</td>
<td></td>
</tr>
<tr>
<td>Kanju Ootsuka (Tokai Univ.)</td>
<td></td>
</tr>
<tr>
<td>Shigeo Sato (Tohoku Univ.)</td>
<td></td>
</tr>
<tr>
<td>Hiroo Sekiya (Chiba Univ.)</td>
<td></td>
</tr>
<tr>
<td>Michael Small (Hong Kong Polytechnic Univ.)</td>
<td></td>
</tr>
<tr>
<td>Norikazu Takahashi (Kyushu Univ.)</td>
<td></td>
</tr>
<tr>
<td>Yuichi Tanji (Kagawa Univ.)</td>
<td></td>
</tr>
<tr>
<td>Shozou Tokinaga (Kyushu Univ.)</td>
<td></td>
</tr>
<tr>
<td>Hiroyuki Torikai (Osaka Univ.)</td>
<td></td>
</tr>
<tr>
<td>Tadashi Tsubone (Nagaoka Univ. Tech.)</td>
<td></td>
</tr>
<tr>
<td>Ken Umeno (NICT)</td>
<td></td>
</tr>
<tr>
<td>Tetsuya Yoshinaga (Tokushima Univ.)</td>
<td></td>
</tr>
</tbody>
</table>
Advisory Committee

K. Aihara (Univ. of Tokyo)  S. Amari (FRP, RIKEN)
G. Chen (City Univ. Hong Kong)  L. O. Chua (U. C. Berkeley)
R. Eberhart (IUPUI)  T. Endo (Meiji Univ.)
A. Fettweis (Ruhr Univ. Bochum)  L. Fortuna (Univ. of Catania)
W. J. Freeman (U. C. Berkeley)  M. Hasler (EPFL)
H. Hayashi (Kyushu Inst. of Tech.)  T. Hikihara (Kyoto Univ.)
K. Horiuchi (Waseda Univ.)  M. Iri
K. Judd (Univ. of Western Australia)  H. Kawakami (Tokushima Univ.)
M. P. Kennedy (Univ. College Cork)  T. Kohda (Kyushu Univ.)
E. S. Kuh (U. C. Berkeley)  R. W. Liu (Univ. of Notre Dame)
T. Matsumoto (Fukui Univ. of Tech.)  I. Mezic (UCSB)
S. Mori (Keio Univ.)  T. Nagashima (Muroran Inst. of Tech.)
K. Nakajima (Tohoku Univ.)  T. Nishi (Waseda Univ.)
J. A. Nossek (Tech. Univ. of Munich)  S. Oishi (Waseda Univ.)
M. J. Ogorzalek (Jagiellonian Univ.)  K. Okumura (Hirosima Inst. of Tech.)
M. Plum (Karlsruhe Univ.)  T. Roska (Pázmány University)
S. M. Rump (Technical Univ. of Humburg)  T. Saito (Hosei Univ.)
I. W. Sandberg (Univ. of Texas at Austin)  Y. Sawada (Tohoku Inst. of Tech.)
W. Schwarz (Tech. Univ. of Dresden)  G. Setti (Univ. of Ferrara)
R. Stoop (ETH / Univ. of Zurich)  M. Tanaka (Sophia Univ.)
L. Trajković (Simon Fraser Univ.)  C. K. Tse (Hong Kong Polytech. Univ.)
Y. Ueda (Waseda Univ.)  A. Ushida (Tokushima Bunri Univ.)
T. Ushio (Osaka Univ.)  J. Vandewalle (KU Leuven)
P. Werbos (National Science Foundation)  A. N. Willson, Jr. (UCLA)
A. H. Zemanian (State Univ. NY at Stony Brook)

IEICE NOLTA Subsociety Steering Committee

Chair
Shin’ichi Oishi (Waseda Univ.)

Secretary
Keiji Konishi (Osaka Prefecture Univ.)

Treasurer
Norikazu Takahashi (Kyushu Univ.)

Members
Hideki Asai (Shizuoka Univ.)  Shinji Doi (Osaka Univ.)
Tetsuro Endo (Meiji Univ.)  Takashi Hisakado (Kyoto Univ.)
Yoshihiko Horio (Tokyo Denki Univ.)  Tohru Ikeguchi (Saitama Univ.)
Kenya Jin’no (ERATO-JST)  Yoshifumi Nishio (Tokushima Univ.)
Yuzo Ohta (Kobe Univ.)  Koshi Okumura (Hirosima Inst. Tech.)
Toshimichi Saito (Hosei Univ.)  Tetsushi Ueta (Tokushima Univ.)
Kiyotaka Yamamura (Chuo Univ.)

xi
Special Session Organizers

- Innovative Nonlinear Control
  Toshimitsu Ushio (Osaka University) and Yuh Yamashita (Hokkaido University)

- Real-Time and Discrete Event Systems I and II
  Shigemasa Takai (Kyoto Institute of Technology)

- Applications of Complex Networks I: Constructing networks from observed data, II: Algorithms and applications
  Micheal Small and Chi Kong Tse (Hong Kong Polytechnic University)

- Nonlinear Time Series Analysis I: Spatially extended systems and state estimation, II: Stochastic models and statistical methods
  Micheal Small and Chi Kong Tse (Hong Kong Polytechnic University)

- Nonlinear behavior caused by switching dynamics I and II
  Tetsushi Ueta (Tokushima University) and Danièle Fournier (INSA Toulouse)

- Optimization through Nonlinear Dynamics
  Kenya Jin’no (ERATO, JST)

- Intelligent Robotics
  Hiroshi Igarashi (Tokyo Denki University)

- Nonlinear Spatial-temporal logic via Cellular Wave Computers I and II
  Tamás Roska (Pazmany University)

- Advanced Modeling and Simulation
  Hideki Asai (Shizuoka University) and Mamoru Tanaka (Sophia University)

- Verified bounds in optimization problems I and II
  Siegfried Rump (Hamburg University of Technology) and Shin’ichi Oishi (Waseda University)

- Accurate summation algorithm of floating point numbers
  Siegfried Rump (Hamburg University of Technology) and Shin’ichi Oishi (Waseda University)
Symposium Information

Symposium Venue
Danubius Health Spa Resort Helia
1133 Budapest, Kárpát u. 62–64.
Phone: +36 1 889-5800, Fax: +36 1 889-5801
E-mail: helia@danubiushotels.com
Internet: www.danubiushotels.com/helia

Floor Plan

- Operation hours and the location of the registration desk are:
  - Sunday, September 7, 16:00–22:00 at Hotel lobby, ground floor
  - Monday, September 8, 8:00–17:00 in front of Helia conference room
  - Tuesday, September 9, 8:00–17:00 in front of Helia conference room
  - Wednesday, September 10, 8:00–17:00 in front of Helia conference room
- Author preparation room is available: Pluto Room.

Social Events

Welcome reception  Sunday, September 7, 19:00–, at the venue, details on site.

Banquet  Tuesday, September 9, 19:00–23:00, at Borkatakomba restaurant. We provide a shuttle bus service. Details on site.

Farewell party  Wednesday, September 10, 18:00–, details on site.
## Session at a Glance

### September 8, 2008 (Monday)

<table>
<thead>
<tr>
<th>time \ room</th>
<th>Panorama</th>
<th>Mercure</th>
<th>Orion</th>
<th>Uranus A</th>
<th>Venus</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00–9:30</td>
<td>Opening ceremony, Helia conference room</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:30–10:00</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:40–13:00</td>
<td>Lunch break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:00–14:40</td>
<td>A2L-B (S) Applications of Complex Networks I: Constructing Networks from Observed Data, Chr: Yuming Shi Page xix</td>
<td>A2L-C (S) Nonlinear Spatial-Temporal Logic via Cellular Wave Computers I, Chr: Tamas Roska Page xx</td>
<td>A2L-D Image and Signal Processing II, Chr: Kristina Kelber Page xxi</td>
<td>A2L-E Chaos and Bifurcation I, Chr: Sunao Murashige Page xxi</td>
<td>A2L-F Optimization II, Chr: Mikio Hasegawa Page xxii</td>
</tr>
<tr>
<td>14:40–15:10</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17:10–18:10</td>
<td>A4L-A Inaugural Talk, Chr: Tamas Roska , Helia conf. room, page xxv</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(S) Special session
### September 9, 2008 (Tuesday)

<table>
<thead>
<tr>
<th>time \ room</th>
<th>Helia</th>
<th>Orion</th>
<th>Uranus B</th>
<th>Uranus A</th>
<th>Venus</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00–10:00</td>
<td>B1L-A Plenary Talk 1, Chr: Yoshihiko Horio , Helia conf. room, page xxv</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–10:30</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30–12:10</td>
<td>B2L-B Complex Networks and Systems II, Chr: Tomoya Suzuki</td>
<td>B2L-C Learning and Memory, Chr: Masaharu Adachi</td>
<td>B2L-E Chaos and Bifurcation III, Chr: Mieczyslaw Jessa</td>
<td>B2L-F Control I, Chr: Takafumi Kanazawa</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page xxv</td>
<td>Page xxvi</td>
<td>Page xxvii</td>
<td>Page xxvii</td>
<td></td>
</tr>
<tr>
<td>12:10–13:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lunch break</td>
</tr>
<tr>
<td>13:30–15:10</td>
<td>B3L-B (S) Nonlinear Time Series Analysis I: Spatially Extended Systems State Estimation, Chr: Tomomichi Nakamura</td>
<td>B3L-C (S) Nonlinear Behavior Caused by Switching Dynamics I, Chr: Tetsushi Ueta</td>
<td>B3L-D Modeling and Simulation, Chr: Yuichi Tanji</td>
<td>B3L-E Chaos and Bifurcation IV, Chr: Marco Storace</td>
<td>B3L-F Control II and Fuzzy, Chr: Hitoshi Takata</td>
</tr>
<tr>
<td></td>
<td>Page xxviii</td>
<td>Page xxviii</td>
<td>Page xxix</td>
<td>Page xxx</td>
<td>Page xxx</td>
</tr>
<tr>
<td>15:10–15:40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coffee break</td>
</tr>
<tr>
<td>15:40–17:20</td>
<td>B4L-B (S) Nonlinear Time Series Analysis II: Stochastic Models and Statistical Methods, Chr: Chi K. Tse</td>
<td>B4L-C (S) Nonlinear Behavior Caused by Switching Dynamics II, Chr: Pascal Acco</td>
<td>B4L-D (S) Advanced Modeling and Simulation, Chrs: Hideki Asai and Mamoru Tanaka</td>
<td>B4L-E Neural Networks I, Chr: Norikazu Takahashi</td>
<td>B4L-F Circuits and Systems I, Chr: Yoshifumi Nishio</td>
</tr>
<tr>
<td></td>
<td>Page xxxi</td>
<td>Page xxxi</td>
<td>Page xxxi</td>
<td>Page xxxii</td>
<td>Page xxxii</td>
</tr>
<tr>
<td>19:00–23:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Banquet</td>
</tr>
</tbody>
</table>

(S) Special session
<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Helia</th>
<th>Uranus B</th>
<th>Orion</th>
<th>Uranus A</th>
<th>Venus</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00–10:00</td>
<td>C1L-A Plenary Talk 2, Chr: Tohru Ikeguchi, Helia conf. room, page xxxiii</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00–10:30</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30–12:10</td>
<td>C2L-B (S) Innovative Nonlinear Control, Chr: Toshimitsu Ushio</td>
<td>C2L-C (S) Accurate Summation Algorithms of Floating Point Numbers, Chr: Shin‘ichi Oishi</td>
<td>C2L-D Oscillations and Oscillators I, Chr: Orla Feely</td>
<td>C2L-E Neural Networks II, Chr: Hisashi Aomori</td>
<td>C2L-F Circuits and Systems II, Chr: Seiichiro Moro</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page xxxiv</td>
<td>Page xxxiv</td>
<td>Page xxxv</td>
<td>Page xxxv</td>
<td>Page xxxvi</td>
<td></td>
</tr>
<tr>
<td>12:10–13:30</td>
<td>Lunch break</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:30–15:10</td>
<td>C3L-B (S) Real-Time and Discrete Event Systems I, Chr: Shigamasu Takai</td>
<td>C3L-C (S) Verified Bounds in Optimization Problems I, Chr: Siegfried Rump</td>
<td>C3L-D Oscillations and Oscillators II, Chr: Takaya Miyano</td>
<td>C3L-E Neural Networks III, Chr: Gouhei Tanaka</td>
<td>C3L-F Communication I, Chr: Yutaka Jitsumatsu</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page xxxvii</td>
<td>Page xxxvii</td>
<td>Page xxxviii</td>
<td>Page xxxviii</td>
<td>Page xxxix</td>
<td></td>
</tr>
<tr>
<td>15:10–15:40</td>
<td>Coffee break</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:40–17:20</td>
<td>C4L-B (S) Real-Time and Discrete Event Systems II, Chr: Toshiyuki Miyamoto</td>
<td>C4L-C (S) Verified Bounds in Optimization Problems II, Chr: Takeshi Ogita</td>
<td>C4L-D Oscillations and Oscillators III, Chr: Yoko Uwate</td>
<td>C4L-E Neural Networks IV, Biocybernetics and Bioengineering, Chr: Tadashi Tsubone</td>
<td>C4L-F Communication II, Chr: Hidehiro Nakano</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page xxxix</td>
<td>Page xl</td>
<td>Page xl</td>
<td>Page xli</td>
<td>Page xli</td>
<td></td>
</tr>
<tr>
<td>18:00–</td>
<td>Closing ceremony &amp; Farewell party, Helia conference room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(S) Special session
Technical Program

A1L-B Complex Networks and Systems I

DATE: September 8, 10:00–11:40
ROOM: Panorama
CHAIR: Takayuki Kimura (Hong Kong Polytechnic University)

A1L-B1 Efficiency of Statistical Measures to Estimate Network Structure of Chaos Coupled Systems
Yuta Ueoka (Doshisha University), Tomoya Suzuki (Doshisha University), Tohru Ikeguchi (Saitama University), Yoshihiko Horio (Tokyo Denki University)

A1L-B2 Analyzing and Composing Music with Complex Networks: Finding Structures in Bach’s, Chopin’s and Mozart’s
Chi K. Tse (Hong Kong Polytechnic University), Xiaofan Liu (Hong Kong Polytechnic University), Michael Small (Hong Kong Polytechnic University)

A1L-B3 Uncovering Network Architecture from Controlled Steady State Responses
Dongchuan Yu (Qingdao University), Martin Hasler (Ecole Polytechnique Fédérale de Lausanne)

A1L-C SPECIAL SESSION: Intelligent Robotics

DATE: September 8, 10:00–11:40
ROOM: Mercure
CHAIR: Hiroshi Igarashi (Tokyo Denki University)

A1L-C1 Adaptive Path Control for Holonomic Automated Guided Vehicles (AGV)
Koichi Hidaka (Tokyo Denki University)

A1L-C2 Development of a Sensor Node with Impact-Resistance Capability to Gather the Disaster Area Information
Kei Sawai (Tokyo Denki University), Tsuyoshi Suzuki (Tokyo Denki University), Hitoshi Kono (Tokyo Denki University), Yasushi Hada (National Institute of Information and Communications Technology), Kuniaki Kawabata (RIKEN)

A1L-C3 Tracing Control for a Tracked Vehicle Based on Prediction Model of Virtual Wheeled Robot
A1L-D Image and Signal Processing I

DATE: September 8, 10:00–11:40
ROOM: Orion
CHAIR: Shin Mizutani (NTT Communication Science Laboratories)

A1L-D1 Minimization of L2-Sensitivity for State-Estimate Feedback Controllers Subject to L2-Scaling Constraints Using Quasi-Newton Method
Takao Hinamoto (Hiroshima University), Takuro Kawagoe (Hiroshima University)

A1L-D2 Signal-Adaptive Nonlinear Filtering for Scratch Reduction in Images
Kristina Kelber (University of Applied Sciences Dresden), Alexander Hübler (University of Applied Sciences Dresden)

A1L-D3 Multi-Way Nonnegative Tensor Factorization Using Fast Hierarchical Alternating Least Squares Algorithm (HALS)
Anh Huy Phan (Brain Science Institute, RIKEN), Andrzej Cichocki (Brain Science Institute, RIKEN)

A1L-D4 Complementary Aspects of Spectral and Entropic Measures of Time-Series
Mark Titchener (University of Auckland)

A1L-E Applied Mathematics

DATE: September 8, 10:00–11:40
ROOM: Uranus A
CHAIR: Takashi Hisakado (Kyoto University)

A1L-E1 On a New Dissimilarity of Projection Correlation
Yasunori Endo (University of Tsukuba), Fuyuki Uchida (ICL Inc), Yukihiro Hamasuna (University of Tsukuba)

A1L-E2 A Method for the Generation of a Class of Ill-Conditioned Matrices
Tetsuo Nishi (Waseda University), Takeshi Ogita (Waseda University), Shin’ichi Oishi
A1L-E3 Analysis of Periodic Solutions in Lasota-Wazewska Equation
Pawel Mitkowski (AGH-University of Science and Technology)

A1L-E4 The LDU-Decomposition for the Fundamental Matrix of Time-Varying Systems
Pieter Van Der Kloet (Petitrix Research BV), Fred Neerhoff (Neerhoff Productions BV), Nanning Waning (Nanning Waning Productions BV)

A1L-F Optimization I
DATE: September 8, 10:00–11:40
ROOM: Venus
CHAIR: Hideo Kanemitsu (Hokkaido University of Education)

A1L-F1 Optimization Using Higher-Order Chaotic Neural Networks
Taro Kuroda (Tokyo University of Science), Mikio Hasegawa (Tokyo University of Science)

A1L-F2 A Method for Solving Asymmetric Traveling Salesman Problems Using Neural Networks and Block Shift Operations with Tabu Search
Toshihiro Tachibana (Tokyo Denki University), Masaharu Adachi (Tokyo Denki University)

A1L-F3 A New Decomposition Algorithm for Solving Convex Quadratic Programming Problems
Norikazu Takahashi (Kyushu University), Yuta Kobayashi (Kyushu University), Bo Chen (Kyushu University)

A1L-F4 An Effective Chaotic Search by Using 2-Opt and or-Opt Algorithms for Traveling Salesman Problem
Takafumi Matsuura (Saitama University), Tohru Ikeguchi (Saitama University)

A2L-B SPECIAL SESSION: Applications of Complex Networks I: Constructing Networks from Observed Data
DATE: September 8, 13:00–14:40
ROOM: Panorama
CHAIR: Yuming Shi (Shandong University)

A2L-B1 A New Measure for the Detection of Directional Couplings Based on Rank Statistics
Daniel Chicharro (Universitat Pompeu Fabra), Anders Ledberg (Universitat Pompeu Fabra), Ralph Andrzejak (Universitat Pompeu Fabra)

A2L-B2 On the Detection of Direct and Indirect Interactions in Multivariate Networks

On the Problem of Estimating Connectivity from Spike Recordings in Large Neuron Networks

Federico Bizzarri (University of Genoa), Marco Storace (University of Genoa), Daniele Stellardo (University of Genoa), Oscar De Feo (Ecole Polytechnique Fédérale de Lausanne / Solianis Monitoring AG)

Time Series Classification by Complex Network Transformation

Jie Zhang (Hong Kong Polytechnic University), Junfeng Sun (Hong Kong Polytechnic University), Xiaohe Xu (Hong Kong Polytechnic University), Michael Small (Hong Kong Polytechnic University)

Structural Equivalence Between Co-Occurrences of Characters and Words in the Chinese Language

Yuming Shi (Shandong University), Wei Liang (Shandong University), Jing Liu (Hong Kong Polytechnic University), Chi K. Tse (Hong Kong Polytechnic University)

A2L-C SPECIAL SESSION: Nonlinear Spatial-Temporal Logic via Cellular Wave Computers I

DATE: September 8, 13:00–14:40
ROOM: Mercure
CHAIR: Tamas Roska (Academician, Pazmany Univ.)

An Overview on Emerging Spatial Wave Logic for Spatial-Temporal Events via Cellular Wave Computers on Flows and Patterns

Tamas Roska (Pazmany University / Hungarian Academy of Sciences)

Pattern Classification with CNNs As Reservoirs

David Verstraeten (Universiteit Gent), Samuel Xavier-De-souza (Katholieke Universiteit Leuven), Benjamin Schrauwen (Universiteit Gent), Johan Suykens (Katholieke Universiteit Leuven), Dirk Stroobandt (Universiteit Gent), Joos Vandewalle (Katholieke Universiteit Leuven)

Towards the Automatic Design of Algorithms for Cellular Wave Computers

Giovanni Egidio Pazienza (Universitat Ramon Llull / Enginyeria i arquitectura La Salle), Xavier Vilasis-Cardona (Universitat Ramon Llull / Enginyeria i arquitectura La Salle)

Implementing the Non-Linear Wave Metric on the Q-Eye Cellular Array Processor Chip

Dániel Bank (Pázmány Péter Catholic University), Ákos Zarándy (Computer and Automation research Institute of the Hungarian Academy of Sciences), Dániel Hillier (Friedrich Miescher Institute for Biomedical Research)
A2L-D Image and Signal Processing II

DATE: September 8, 13:00–14:40
ROOM: Orion
CHAIR: Kristina Kelber (University of Applied Sciences Dresden)

**A2L-D1** Simplified DFT for Hand Posture Recognition System 112
Hiroomi Hikawa (Kansai University), Hirotada Fujimura (Genesis Technology)

**A2L-D2** Noise-Assisted Detection in Distributed Detection System with Inhomogeneous Signal Levels 116
Shin Mizutani (NTT Communication Science Laboratories), Kenichi Arai (NTT Communication Science Laboratories), Peter Davis (NTT Communication Science Laboratories), Naoki Wakamiya (Osaka University), Masayuki Murata (Osaka University)

**A2L-D3** Sequential Superparamagnetic Clustering As a Predictor of Visual Fixations 120
Tom Jasa (University and ETH Zurich), Thomas Lanz (ETH/University of Zürich), Thomas Ott (Zürcher Hochschule für Angewandte Wissenschaften), Ruedi Stoop (ETH Zürich)

**A2L-D4** Stochastic Resonance in Retinomorphic Neural Networks with Nonidentical Photoreceptors and Noisy McCulloch-Pitts Neurons 124
Akira Utagawa (Hokkaido University), Tetsuya Asai (Hokkaido University), Tohru Sahashi (Hokkaido University), Yoshihito Amemiya (Hokkaido University)

A2L-E Chaos and Bifurcation I

DATE: September 8, 13:00–14:40
ROOM: Uranus A
CHAIR: Sunao Murashige (Future University-Hakodate)

**A2L-E1** Synchronization Phenomena in Coupled Parametrically Excited Van der Pol Oscillators 128
Hironori Kumeno (Tokushima University), Yoshifumi Nishio (Tokushima University)

**A2L-E2** FPAA-Based Programmable Implementation of a Chaotic System Characterized with Different Nonlinear Functions 132
Recai Kilic (Erciyes University), Fatma Yildirim Dalkiran (Erciyes University)

**A2L-E3** AC-DC Converters with Hysteresis Switching and Stabilization 136
Yasuhide Ishige (Hosei University), Toshimichi Saito (Hosei University), Yusuke Matsuoka (Hosei University)

**A2L-E4** Analysing Chaotic Attractors by Measures of Complex Networks 140
Yutaka Shimada (Saitama University), Tohru Ikeguchi (Saitama University)
A2L-F Optimization II

DATE: September 8, 13:00–14:40
ROOM: Venus
CHAIR: Mikio Hasegawa (Tokyo University of Science)

A2L-F1 Chaotic Search Method Using the Lin-Kernighan Algorithm for Traveling Salesman Problems
Shun Motohashi (Saitama University), Takafumi Matsuura (Saitama University), Tohru Ikeguchi (Saitama University)

A2L-F2 Distributed Optimization of Lifetime of Wireless Sensor Networks Based on Mutually Connected Neural Networks
Mikio Hasegawa (Tokyo University of Science), Tetsuo Kawamura (Tokyo University of Science), Ha Nguyen Tran (National Institute of Information and Communications Technology), Goh Miyamoto (National Institute of Information and Communications Technology), Hiroshi Harada (National Institute of Information and Communications Technology), Shuzo Kato (National Institute of Information and Communications Technology), Yoshitoshi Murata (Iwate Prefectural University)

A2L-F3 A Representation by Power Series for the Sequence Generated by the Simplified Newton’s Method
Takashi Ozeki (Fukuyama University)

A2L-F4 An Algorithm for Globally Minimizing a Function with Many Local Minimal Values whose Sequence is Unimodal
Hideo Kanemitsu (Hokkaido University of Education), Hideaki Konno (Hokkaido University of Education), Masaaki Miyakoshi (Hokkaido University)

A3L-B SPECIAL SESSION: Applications of Complex Networks II: Algorithms and Applications

DATE: September 8, 15:10–16:50
ROOM: Panorama
CHAIR: Francis Lau (Hong Kong Polytechnic University)

A3L-B1 Ensembling via Prediction Market Mechanisms for Time-Series Forecasting
Christian Merkwirth (Jagiellonian University), Maciej Ogorzalek (Jagiellonian University)

A3L-B2 Detecting Stock Market Fluctuation from Stock Network Structure Variation
Jing Liu (Hong Kong Polytechnic University), Chi K. Tse (Hong Kong Polytechnic University), Keqing He (Wuhan University)

A3L-B3 Short-Length LDPC Codes with Power-Law Distributed Variable-Node Degrees
Xia Zheng (Hong Kong Polytechnic University), Francis C. M. Lau (Hong Kong Polytechnic University)
A3L-C SPECIAL SESSION: Nonlinear Spatial-Temporal Logic via Cellular Wave Computers II

DATE: September 8, 15:10–16:50
ROOM: Mercure
CHAIR: Tamas Roska (Academician, Pazmany Univ.)

A3L-C1 Implementation Aspects of a Topographic Cellular Active Contour Algorithm
Dániel Hillier (Friedrich Miescher Institute for Biomedical Research), Zsolt Czeilinger (Pázmány Péter Catholic University), Csaba Rekeczky (Eutecus Inc)

Norbert Bérci (Péter Pázmány Catholic University), Péter Szolgay (Péter Pázmány Catholic University)

A3L-C3 Real-Time Moving Object Segmentation Algorithm Implemented on the Eye-RIS Focal Plane Sensor-Processor System
Tamas Fülöp (Peter Pazmany Catholic University), Ákos Zarányi (Computer and Automation research Institute of the Hungarian Academy of Sciences)

A3L-C4 Some Chaotic Properties of the Beta-Hysteresis Transformation
Barnabás Garay (Budapest University of Technology), Rudolf Csikja (Budapest University of Technology), János Tóth (Budapest University of Technology)

A3L-D Image and Signal Processing III

DATE: September 8, 15:10–16:50
ROOM: Orion
CHAIR: Ruedi Stoop (UNI/ETH Zurich)

A3L-D1 A Hybrid Neural System for ROI Selection in Microcalcification Detection
László Lasztovicza (Budapest University of Technology and Economics), Béla Pataki (Budapest University of Technology and Economics)

**A3L-D2 Pattern Formation of Self-Organized Feature Extraction in a Three-Dimensional Discrete Reaction-Diffusion System**

Kazuyuki Miura (Yamaguchi University), Atsushi Osa (Yamaguchi University), Hidetoshi Miike (Yamaguchi University)

**A3L-D3 Sparse Representation of L-Order Markov Signals**

Zhaoshui He (Brain Science Institute, RIKEN), Andrzej Cichocki (Brain Science Institute, RIKEN)

---

**A3L-E Chaos and Bifurcation II**

DATE: September 8, 15:10–16:50  
ROOM: Uranus A  
CHAIR: Yasuteru Hosokawa (Shikoku University)

**A3L-E1 Time-Delayed Feedback Control with an Unstable Control Loop Realizing Wide Range Operation**

Hiroyuki Shirahama (Ehime University), Klaus Höhne (TU Darmstadt), Hartmut Benner (TU Darmstadt), Wolfram Just (Queen Mary / University of London)

**A3L-E2 Improvement of the Multiple Shooting Method for Stability Analysis of Periodic Orbits of Ordinary Differential Equations**

Yu Nureki (University of Tokyo), Sunao Murashige (Future University, Hakodate)

**A3L-E3 Method of Falsification Detection for JPEG Images Using Chaotic Watermarks and its Evaluation**

Masaru Hisano (Meiji University), Taichi Umezawa (Meiji University), Hiroyuki Kamata (Meiji University)

**A3L-E4 Research on Coupled Systems of Chaotic Oscillators and Noisy Oscillators**

Ryo Imabayashi (Tokushima University), Yoko Uwate (ETH Zürich), Yoshifumi Nishio (Tokushima University)

---

**A3L-F SPECIAL SESSION: Optimization through Nonlinear Dynamics**

DATE: September 8, 15:10–16:50  
ROOM: Venus  
CHAIR: Kenya Jin’no (ERATO, JST)

**A3L-F1 An Improved Ant Colony Optimization for Quadratic Assignment Problems**

xxiv
Kenya Jin’no (ERATO, JST), Mari Satoh (Kanto Gakuin University), Kazuyuki Aihara (University of Tokyo)

A3L-F2 Basic Particle Swarm Optimizer and its Application in Power Electronics
Katsuma Ono (Hosei University), Eiji Miyagawa (Hosei University), Toshimichi Saito (Hosei University)

Tohru Ikeguchi (Saitama University), Kazuyuki Aihara (University of Tokyo)

A3L-F4 Combinatorial Optimization with Physical Chaotic Neuro-Dynamics through Conscious and Subconscious Processes
Yoshihiko Horio (Tokyo Denki University), Kazuyuki Aihara (University of Tokyo)

A4L-A Inaugural Talk
DATE: September 8, 17:10–18:10
ROOM: Helia Conference Room
CHAIR: Tamas Roska (Academician, Pazmany Univ.)

A4L-A1 The Missing Memristor Found
Leon Chua (University of California, Berkeley)

B1L-A Plenary Talk 1
DATE: September 9, 9:00–10:00
ROOM: Helia Conference Room
CHAIR: Yoshihiko Horio (Tokyo Denki University)

B1L-A1 Known and Unknown Phenomena of Nonlinear Behaviors in the Power Harvesting Mat and the Transverse Wave Speaker
Yoshiyasu Takefuji (Keio University)

B2L-B Complex Networks and Systems II
DATE: September 9, 10:30–12:10
ROOM: Helia Conference Room
CHAIR: Tomoya Suzuki (Doshisha University)

B2L-B1 Winner-Take-All Correlation-Based Complex Networks for Modeling Stock Market and Degree-Based Indexes
Chi K. Tse (Hong Kong Polytechnic University), Jing Liu (Hong Kong Polytechnic University)
A Game Theoretic Approach for User Participation in Grid Projects

Igor Mishkovski (University Ss Cyril and Methodious), Dimitar Trajanov (University Ss Cyril and Methodious), Sonja Filiposka (University Ss Cyril and Methodious), Ljupco Kocarev (Macedonian Academy of Sciences and Arts)

A Modal Analysis Based Approach in Studying Robustness and Vulnerability of Complex Networks

Irina Petreska (Macedonian Academy of Sciences and Arts), Igor Tomovski (ICEIM-MANU), Eugenio Gutierrez (Joint Research Centre / ELSA), Ljupco Kocarev (Macedonian Academy of Sciences and Arts), Flavio Bono (Joint Research Centre / ELSA), Karmen Poljansek (Joint Research Centre / ELSA)

Construction of Scale-Free Networks with Adjustable Clustering

Wai M. Tam (Hong Kong Polytechnic University), Francis C. M. Lau (Hong Kong Polytechnic University), Chi K. Tse (Hong Kong Polytechnic University)

B2L-C Learning and Memory

DATE: September 9, 10:30–12:10
ROOM: Orion
CHAIR: Masaharu Adachi (Tokyo Denki University)

GHSOM with Ranking Mapping Scheme

Mitsushi Yoshida (Sophia University), Masatoshi Sato (Sophia University), Daisuke Shima (IBM), Hisashi Aomori (Sophia University), Mamoru Tanaka (Sophia University)

Weighted Blowups of Kullback Information and Application to Multinomial Distributions

Takeshi Matsuda (Tokyo Institute of Technology), Sumio Watanabe (Tokyo Institute of Technology)

Mathematical Model of Memory Consolidation Using Alternate Sampling Between Neocortex and Hippocampus

Makito Oku (University of Tokyo), Kazuyuki Aihara (University of Tokyo)

A Profit Sharing Reinforcement Learning Method Using a Memory-Based Dynamic Reinforcement Function

Masaaki Usui (Musashi Institute of Technology), Hidehiro Nakano (Musashi Institute of Technology), Arata Miyauchi (Musashi Institute of Technology)
B2L-E Chaos and Bifurcation III

DATE: September 9, 10:30–12:10
ROOM: Uranus A
CHAIR: Mieczyslaw Jessa (Poznan University of Technology)

B2L-E1 A Parameter-Dependent Approximation of the Hindmarsh-Rose Neuron Model Suitable for Analog Circuit Implementation 277
Federico Bizzarri (University of Genoa), Daniele Linaro (University of Genoa), Marco Storace (University of Genoa)

B2L-E2 Nonlinear Spring Model of Self-Organizing Map Arranged in Two-Dimensional Array 281
Haruna Matsushita (Tokushima University), Yoshifumi Nishio (Tokushima University)

B2L-E3 Chaotic Circuit Using a Ring Oscillator and a Van der Pol Oscillator 285
Yasuteru Hosokawa (Shikoku University), Yoshifumi Nishio (Tokushima University)

B2L-E4 Bifurcation Analysis of Chaos Synchronization in Coupled BVP Oscillators 289
Satoshi Nishioka (Tokushima University), Tetsushi Ueta (Tokushima University)

B2L-F Control I

DATE: September 9, 10:30–12:10
ROOM: Venus
CHAIR: Takafumi Kanazawa (Osaka University)

B2L-F1 Nonlinear Control Design via Formal Linearization of Polynomial Type Using Taylor Expansion 293
Kazuo Komatsu (Kumamoto National College of Technology), Hitoshi Takata (Kagoshima University)

B2L-F2 Augmented Automatic Choosing Control of Nonlinear Observer Type for Nonlinear Systems with Linear Measurement and its Application 297
Hitoshi Takata (Kagoshima University), Tomohiro Hachino (Kagoshima University), Kengo Kohama (Kagoshima University), Tosinori Nawata (Kumamoto National College of Technology)

B2L-F3 Feedback Control of Spiral Waves in a Cellular Automata Model of Excitable Media 301
Hiroko Yoneshima (Osaka Prefecture University), Keiji Konishi (Osaka Prefecture University), Hideki Kokame (Osaka Prefecture University)

B2L-F4 Solvability Analysis and Stabilization of the Cart-Pendulum Modeled by Discrete Mechanics with Friction 305
Tatsuya Kai (Osaka University), Kensuke Bito (Osaka University)

B2L-F5 Adaptive Control of Steady States and Slowly Varying States in the Duffing-Holmes Type System with Unstable High-Pass Filter 309
B3L-B SPECIAL SESSION: Nonlinear Time Series Analysis I: Spatially Extended Systems State Estimation

DATE: September 9, 13:30–15:10
ROOM: Helia Conference Room
CHAIR: Tomomichi Nakamura (Sony Computer Science Laboratories)

B3L-B1 A Transfer Operator Based Numerical Investigation of Coherent Structures in Three-Dimensional Southern Ocean Circulation
Gary Froyland (University of New South Wales), Marcel Schwalb (University of Paderborn), Kathrin Padberg (Technical University Dresden), Michael Dellnitz (University of Paderborn)

B3L-B2 Dynamical Mechanisms Underlying Avian Influenza Outbreaks
Cristian Carmeli (Hong Kong Polytechnic University), Michael Small (Hong Kong Polytechnic University)

B3L-B3 The Quest for a Shady Place: a Guide (Using Shadowing Filters for State Estimation)
Thomas Stemler (University of Western Australia), Kevin Judd (University of Western Australia)

B3L-B4 Turning Point Prediction of Oscillating Time Series Using Local Dynamic Regression Models
Dimitris Kugiumtzis (Aristotle University of Thessaloniki), Ioannis Vlachos (Aristotle University of Thessaloniki)

B3L-B5 Assessing the Local Stability of Action Potential Propagation in Cardiac Tissue
Enno De Lange (University of Bern), Jan Kucera (University of Bern)

B3L-C SPECIAL SESSION: Nonlinear Behavior Caused by Switching Dynamics I

DATE: September 9, 13:30–15:10
ROOM: Orion
CHAIR: Tetsushi Ueta (Tokushima University)

B3L-C1 Bifurcation Phenomena of the Rotation Map with a Controlling Segment
Yusuke Matsuoka (Hosei University), Toshimichi Saito (Hosei University)
B3L-C2 Interacting Bifurcations in Switching Systems
Yanfeng Chen (South China University of Technology), Chi K. Tse (Hong Kong Polytechnic University), Wolfgang Schwarz (Technical University Dresden), Shui-Sheng Qiu (South China University of Technology)

B3L-C3 Accurate and Fast Event Detection Occurrence in Planar Piecewise Affine Hybrid Systems
Fatima El Guezar (INSA - Toulouse), Pascal Acco (INSA - Toulouse), Hassane Bouzair (University Ibn Zohr), Danièle Fournier-Prunaret (INSA - Toulouse)

B3L-C4 Synchronization in Synaptically Coupled Neurons with Hub Structure
Ryosuke Ochi (Kagawa University), Hiroyuki Kitajima (Kagawa University), Eri Ioka (Kagawa University)

B3L-C5 Synchronized States in Square Wave Oscillators Coupled by a Capacitor
Shingo Tomonaga (Oita University), Takuji Kousaka (Oita University)

B3L-D Modeling and Simulation

DATE: September 9, 13:30–15:10
ROOM: Uranus B
CHAIR: Yuichi Tanji (Kagawa University)

B3L-D1 Circuit-Based FDTD Method Using Reluctance Matrix
Yuichi Tanji (Kagawa University), Hideki Asai (Shizuoka University)

B3L-D2 A Cellular Structural Analysis for Covariance Structure
Ryo Sekiyama (Sophia University), Hisashi Aomori (Sophia University), Mamoru Tanaka (Sophia University)

B3L-D3 Synchronization of Model Neurons to AM Auditory Stimuli
Stefan Martignoli (University and ETH Zurich), Ruedi Stoop (ETH Zürich)

B3L-D4 Realization of Bond Graph Models by Wave Digital Structures
Markus Schmidt (University of Paderborn)

B3L-D5 A Method for Circuit Analysis Using Haar Wavelet Transform with Adaptive Resolution
Masanori Oishi (University of Fukui), Seiichiro Moro (University of Fukui), Tadashi Matsumoto (Fukui University of Technology)
B3L-E Chaos and Bifurcation IV

DATE: September 9, 13:30–15:10
ROOM: Uranus A
CHAIR: Marco Storace (University of Genoa)

B3L-E1 Statistical Tests for the SVD-Based Analysis of Dynamical Noise on Chaos
Masaru Todoriki (University of Tokyo), Shuichi Hasegawa (University of Tokyo)

B3L-E2 Synchronization Patterns Generated in Globally Cross-Coupled Chaotic Circuits
Yumiko Uchitani (Tokushima University), Yoshifumi Nishio (Tokushima University)

B3L-E3 On Some Difference Between Chua’s Circuits with Different Nonlinearities
Mieczyslaw Jessa (Poznan University of Technology)

B3L-E4 Chaotic Map with Parameter Changing Shape of the Map for a Cryptosystem
Shuichi Aono (Tokushima University), Yoshifumi Nishio (Tokushima University)

B3L-F Control II and Fuzzy

DATE: September 9, 13:30–15:10
ROOM: Venus
CHAIR: Hitoshi Takata (Kagoshima University)

B3L-F1 Nonlinear Output Tracking Control of a Synchronous Generator Using Input-Output Feedback Linearization
Khalil Jouili (Réseau National Universitaire / LECAP), Houssem Jerbi (Réseau National Universitaire / LECAP EPTunisie)

B3L-F2 Bifurcation Phenomena of Replicator Dynamics with Dynamic Capitation Tax
Takafumi Kanazawa (Osaka University), Toshimitsu Ushio (Osaka University), Yasuhiko Fukumoto (Osaka University)

B3L-F3 Fuzzy C-Means for Data with Tolerance Introducing Penalty Term in Feature Space
Yuchi Kanzawa (Shibaura Institute of Technology), Yasunori Endo (University of Tsukuba), Sadaaki Miyamoto (University of Tsukuba)

B3L-F4 TS-Type Fuzzy Automaton for Supervisory Control
Janos Grantner (Western Michigan University), George Fodor (ABB AB)
B4L-B SPECIAL SESSION: Nonlinear Time Series Analysis II: Stochastic Models and Statistical Methods

DATE: September 9, 15:40–17:20
ROOM: Helia Conference Room
CHAIR: Chi K. Tse (Hong Kong Polytechnic University)

B4L-B1 Investigating Features of Irregular Fluctuations of Cortical Synapse Data 404
Tomomichi Nakamura (Sony Computer Science Laboratories), Michael Small (Hong Kong Polytechnic University), Hugh Robinson (University of Cambridge)

B4L-B2 Training and Scoring of Probabilistic Classifiers 408
Jochen Bröcker (Max Planck Institute for the Physics of Complex Systems)

B4L-B3 Significance for a Recurrence Based Transition Analysis 412
Norbert Marwan (University of Potsdam), Stefan Schinkel (University of Potsdam), Jürgen Kurths (Potsdam Institute of Climate Impact Research)

B4L-B4 Stochastic Modelling of Chaotic Time Series 416
Thomas Stemler (University of Western Australia), Johannes Werner (TU Darmstadt), Hartmut Benner (TU Darmstadt), Wolfram Just (Queen Mary / University of London)

B4L-B5 Chaos and Bifurcation in a Stochastic Model of the Calyx of Held 420
Michael Small (Hong Kong Polytechnic University), Hugh Robinson (University of Cambridge)

B4L-C SPECIAL SESSION: Nonlinear Behavior Caused by Switching Dynamics II

DATE: September 9, 15:40–17:20
ROOM: Orion
CHAIR: Pascal Acco (University of Toulouse)

B4L-C1 Bifurcation Analysis of Izhikevich Model 424
Akihisa Tamura (Tokushima University), Tetsushi Ueta (Tokushima University), Shigeki Tsuji (Aihaara Complexity Modelling Project)

B4L-C2 Numerical Bifurcation Analysis of Systems with Variable Switching Conditions 428
Quentin Brandon (University of Tokushima), Tetsushi Ueta (University of Tokushima), Takuji Kousaka (Oita University), Danièle Fournier-Prunaret (INSA - Toulouse)

B4L-C3 Bifurcation in Neurons Driven by Synaptic Currents with Multiple Frequencies 432
Eri Ioka (Kagawa University), Hiroyuki Kitajima (Kagawa University)

**B4L-C4** Two-Dimensional Piecewise Defined Maps Realized with a Simple Switching Circuit

Pascal Chargé (INSA - Toulouse), Danièle Fournier-Prunaret (INSA - Toulouse), Laura Gardini (University of Urbino)

**B4L-D SPECIAL SESSION: Advanced Modeling and Simulation**

**DATE:** September 9, 15:40–17:20

**ROOM:** Uranus B

**CHAIRS:** Hideki Asai (Shizuoka University) and Mamoru Tanaka (Sophia University)

**B4L-D1** Application of Latency Insertion Method to CMOS Circuit Simulation

Tadatoshi Sekine (Shizuoka University), Hideki Asai (Shizuoka University)

**B4L-D2** Stochastic Modeling and Verification of a 0.35 µm CMOS Chaos-Based True Random Number Generator

Fabio Pareschi (Università di Bologna / ENDIF), Riccardo Rovatti (University of Bologna / ARCES), Gianluca Setti (Università di Bologna / ENDIF)

**B4L-D3** Functional Sigma-Delta CNN

Hisashi Aomori (Sophia University), Mamoru Tanaka (Sophia University)

**B4L-D4** Data Mining CNN to Circuit Modeling

Mamoru Tanaka (Sophia University), Yuko Zennyoji (NTT Data Co), Hisashi Aomori (Sophia University)

**B4L-E Neural Networks I**

**DATE:** September 9, 15:40–17:20

**ROOM:** Uranus A

**CHAIR:** Norikazu Takahashi (Kyushu University)

**B4L-E1** Autonomous and Decentralized Optimization for Fair Radio Resource Selection by Higher-Order Neural Networks

Taichi Takeda (Tokyo University of Science), Kuroda Taro (Tokyo University of Science), Mikio Hasegawa (Tokyo University of Science), Hiroshi Harada (National Institute of Information and Communications Technology), Shuzo Kato (National Institute of Information and Communications Technology), Yoshitoshi Murata (Iwate Prefectural University)

**B4L-E2** Maximum Flow Problem to Be Solved Based on Unidirectional Cellular Neural Network

Masatoshi Sato (Sophia University), Hisashi Aomori (Sophia University), Mamoru Tanaka
A Hierarchical Chaotic Neural Network Model for Multistable Binocular Rivalry
Yuta Kakimoto (University of Tokyo), Kazuyuki Aihara (University of Tokyo)

A Heuristic Approach to Graph Coloring Problems Using a Complex-Valued Neural Network
Gouhei Tanaka (University of Tokyo), Kazuyuki Aihara (University of Tokyo)

B4L-F Circuits and Systems I

DATE: September 9, 15:40–17:20
ROOM: Venus
CHAIR: Yoshifumi Nishio (Tokushima University)

The Mixed Time-Frequency Steady-State Analysis Method for Nonlinear Circuits Driven by Multitone Signals
Tatsuya Kuwazaki (Kanagawa Institute of Technology), Jun Shirataki (Kanagawa Institute of Technology), Makiko Okumura (Kanagawa Institute of Technology)

Code Acquisition for Asynchronous Multi-User Chaos-Based DS-CDMA Systems

A Fixed Point Theorem for Successively Recursively Mapping Equations and its Applications
Kazuo Horiuchi (Waseda University)

C1L-A Plenary Talk 2

DATE: September 10, 9:00–10:00
ROOM: Helia Conference Room
CHAIR: Tohru Ikeguchi (Saitama University)

Potpourri of Applications of Complex Networks Research
Chi K. Tse (Hong Kong Polytechnic University)
C2L-B SPECIAL SESSION: Innovative Nonlinear Control

DATE: September 10, 10:30–12:10
ROOM: Helia Conference Room
CHAIR: Toshimitsu Ushio (Osaka University)

C2L-B1 Geometric Aspects of a Certain Type of Nonlinear Diffusion Equations
Atsumi Ohara (Osaka University), Tatsuaki Wada (Ibaraki University)

C2L-B2 On the Construction of Piecewise Quadratic Lyapunov Functions
Yuzo Ohta (Kobe University), Hisashi Yokoyama (Kobe University)

C2L-B3 Controller Design for 2-Dimensional Nonlinear Control Systems Generating Limit Cycles and its Application to Spacerobots
Tatsuya Kai (Osaka University), Ryo Masuda (Osaka University)

C2L-B4 A Discrete-Time Control Approach for Stabilizing Unknown Steady State of Chaotic Systems
Tadashi Tsubone (Nagaoka University of Technology), Kenichi Kurimoto (Nagaoka University of Technology), Yasuhiro Wada (Nagaoka University of Technology)

C2L-B5 Evolutionary Game Model of Water Resource Development Problem
Ryuzaburo Takeda (Osaka University), Takafumi Kanazawa (Osaka University), Toshimitsu Ushio (Osaka University)

C2L-C SPECIAL SESSION: Accurate Summation Algorithms of Floating Point Numbers

DATE: September 10, 10:30–12:10
ROOM: Uranus B
CHAIR: Shin’ichi Oishi (Waseda University)

C2L-C1 Floating-Point Algorithms Using Error-Free Transformations
Siegfried Rump (Hamburg University of Technology)

C2L-C2 Some Methods to Compute Verified Matrix Determinants
Takeshi Ogita (Tokyo Woman’s Christian University), Siegfried Rump (Hamburg University of Technology), Shin’ichi Oishi (Waseda University)

C2L-C3 Accurate Matrix Multiplication by Using Level 3 BLAS Operation
Katsuhisa Ozaki (Waseda University), Takeshi Ogita (Tokyo Woman’s Christian University), Siegfried Rump (Hamburg University of Technology), Shin’ichi Oishi (Waseda University)

C2L-C4 Fast Verified Automatic Integration Algorithm Using Complex Analysis
Naoya Yamanaka (Waseda University), Takeshi Ogita (Tokyo Woman’s Christian University)
C2L-D Oscillations and Oscillators I

DATE: September 10, 10:30–12:10
ROOM: Orion
CHAIR: Orla Feely (University College Dublin)

C2L-D1 Properties of the Duration of Transient Oscillations in a Ring Neural Network
Yo Horikawa (Kagawa University), Hiroyuki Kitajima (Kagawa University)

C2L-D2 Noise-Induced Increases in the Duration of Transient Oscillations in Ring Neural Networks and Correlations in the Periods of Ring Oscillators
Yo Horikawa (Kagawa University)

C2L-D3 Amplitude Death Induced by Multiple Delay Connections
Keiji Konishi (Osaka Prefecture University), Hideki Kokame (Osaka Prefecture University)

C2L-D4 On the Link of Data Synchronization to Self-Organizing Map Algorithm
Takaya Miyano (Ritsumeikan University), Takako Tsutsui (National Institute of Public Health)

C2L-D5 Pulse Wave Propagation Observed in a Ring of a Large Number of Inductor-Coupled Bistable Oscillators
Kuniyasu Shimizu (Meiji University), Tetsuro Endo (Meiji University), Daishin Ueyama (Meiji University)

C2L-E Neural Networks II

DATE: September 10, 10:30–12:10
ROOM: Uranus A
CHAIR: Hisashi Aomori (Sophia University)

C2L-E1 Edge Enhancement of Color Image by Three-Layer Cellular Neural Network Considering Three Primary Colors
Takashi Inoue (Tokushima University), Yoshifumi Nishio (Tokushima University)

C2L-E2 Modeling Behavioral Tasks to Assess Visual Information Integration and Motor Information Encoding in Parietal Cortex
Alessandro Palladini (University of Bologna), Jugoslava Acimovic (Ecole Polytechnique Fédérale de Lausanne), Martin Hasler (Ecole Polytechnique Fédérale de Lausanne)
C2L-E3  ID Model with Higher-Order Connections for the Traveling Salesman Problem
Takahiro Sota (Tohoku University), Yoshihiro Hayakawa (Tohoku University), Koji Nakajima (Tohoku University)

C2L-E4  Weight Distribution Criterion of Neural Networks for Modeling Chaotic Attractors
Guoqiu Zhang (Harbin Institute of Technology Shenzhen Graduate School), Yi Zhao (Harbin Institute of Technology Shenzhen Graduate School), Hong Hu (Harbin Institute of Technology Shenzhen Graduate School)

C2L-E5  A Simple aVLSI Burst Silicon Neuron Circuit
Takashi Kohno (University of Tokyo / Institute of Industrial Science), Kazuyuki Aihara (University of Tokyo)

C2L-F Circuits and Systems II

DATE: September 10, 10:30–12:10
ROOM: Venus
CHAIR: Seiichiro Moro (Fukui University)

C2L-F1  Motion and Position Detection System Using Mutual Inductance Between Printed Spiral Inductors
Kazuhisa Yoshimatsu (Hiroshima Institute of Technology), Masafumi Nukushina (Sumitomo Electric System Solutions Co), Takashi Kunihiro (Hiroshima Institute of Technology), Tatsuya Nanko (Hiroshima Institute of Technology), Masayuki Yamauchi (Hiroshima Institute of Technology), Mamoru Tanaka (Sophia University)

C2L-F2  Negative Beta-Encoder
Satoshi Hironaka (Kyushu University), Tohru Kohda (Kyushu University), Kazuyuki Aihara (University of Tokyo)

C2L-F3  A Fully-Differential Multi-Hysteresis Two-Port VCCS Chaotic Oscillator Integrated Circuit
Takuya Hamada (Tokyo Denki University), Yoshihiko Horio (Tokyo Denki University), Ryosuke Domae (Tokyo Denki University), Kenya Jin’no (ERATO, JST), Kazuyuki Aihara (University of Tokyo)

C2L-F4  Linear/Nonlinear Approach on Open-Type Magnetic Shielding Method
Takeshi Saito (Kajima Corporation)
C3L-B SPECIAL SESSION: Real-Time and Discrete Event Systems I

DATE: September 10, 13:30–15:10
ROOM: Helia Conference Room
CHAIR: Shigamasa Takai (Kyoto Institute of Technology)

C3L-B1 Power Aware Elastic Scheduling with the Resolution of Trade-Off Between CPU Power Consumption and Task Performance
Sayuri Terada (Osaka University), Toshimitsu Ushio (Osaka University)

Fumiko Harada (Ritsumeikan University), Toshimitsu Ushio (Osaka University), Yukikazu Nakamoto (University of Hyogo)

C3L-B3 On Scheduling and Resource Assignment for Farm Workflows
Senlin Guan (University of the Ryukyus), Morikazu Nakamura (University of the Ryukyus), Takeshi Shikanai (University of the Ryukyus)

C3L-B4 Constructing State Machine Models by Using Petri Nets for the Extended ROOM Method
Toshiyuki Miyamoto (Osaka University), Hiroyuki Kurahata (Osaka University), Taku Fujii (Osaka Prefecture University / Osaka Gas Information System Research Institute), Sadatoshi Kumagaig (Osaka University)

C3L-C SPECIAL SESSION: Verified Bounds in Optimization Problems I

DATE: September 10, 13:30–15:10
ROOM: Uranus B
CHAIR: Siegfried Rump (Hamburg University of Technology)

C3L-C1 A Basic Interval Global Optimization Procedure for Matlab/INTLAB
Tibor Csendes (University of Szeged), László Pál (Sapientia University)

C3L-C2 A Computer-Assisted Proof of Chaotic Behaviour of the Area Preserving Hénon Map
Balázs Bánhelyi (University of Szeged), Tibor Csendes (University of Szeged), Barnabás Garay (Budapest University of Technology)

C3L-C3 Verified Numerical Computations in Convex Programming and Applications
Christian Jansson (Technische Universität Hamburg-Harburg)

C3L-C4 Capabilities of Constraint Programming in Rigorous Global Optimization
Michel Rueher (University of Nice Sophia Antipolis, CNRS), Alexandre Goldsztejn (Université de Nantes / CNRS), Yahia Lebbah (Université d’Oran Es-Senia), Claude Michel (University of Nice Sophia Antipolis, CNRS)

C3L-D Oscillations and Oscillators II

DATE: September 10, 13:30–15:10
ROOM: Orion
CHAIR: Takaya Miyano (Ritsumeikan University)

C3L-D1 Complex Time Homotopy for Finding Periodic Oscillations 605
Takashi Hisakado (Kyoto University), Atsushi Koyama (Kyoto University)

C3L-D2 Amplification of Chaos 609
Ioan Grosu (University of Medicine and Pharmacy Iasi), E Padmanaban (Indian Institute of Chemical Biology), Prodyot Roy (Presidency College), Syamal Dana (Indian Institute of Chemical Biology)

C3L-D3 Group Synchronization of Van der Pol Oscillators with Different Frequencies 612
Yoko Uwate (ETH Zürich), Yoshifumi Nishio (Tokushima University), Ruedi Stoop (ETH Zürich)

C3L-D4 Phase Difference Propagation Phenomena on a Non-Edge Lattice 616
Takeo Imoto (Hiroshima Institute of Technology), Katsutaka Ichiki (Riken Sangyou), Suguru Yamane (Hiroshima Institute of Technology), Masayuki Yamauchi (Hiroshima Institute of Technology)

C3L-E Neural Networks III

DATE: September 10, 13:30–15:10
ROOM: Uranus A
CHAIR: Gouhei Tanaka (The University of Tokyo)

C3L-E1 Lazy Self-Organizing Map Considering Lazy-Neuron Rate for Effective Self-Organization 620
Taku Haraguchi (Tokushima University), Haruna Matsushita (Tokushima University), Yoshifumi Nishio (Tokushima University)

C3L-E2 Basic Analysis of a Leaky Spiking Oscillator with Two Periodic Inputs 624
Tohru Nishigami (Osaka University), Hiroyuki Torikai (Osaka University)

C3L-E3 Detection of Regular Patterns Within Randomness 628
Ruedi Stoop (ETH Zürich), Markus Christen (ETH Zürich)
**C3L-F Communication I**

DATE: September 10, 13:30–15:10  
ROOM: Venus  
CHAIR: Yutaka Jitsumatsu (Kyushu University)

**C3L-F1** A New, Near-Coherent Detector Configuration for UWB Impulse Radio  
Tamás Krébesz (Budapest University of Technology and Economics), Géza Kolumbán (Budapest University of Technology and Economics)

**C3L-F2** Analytical BER Expression of Multi-User Chaos-Based DS-CDMA System Using a Piecewise Linear Chaotic Map  

**C3L-F3** Grouping of Mobile Nodes in MANET Using an ART Network  
Hidehiro Nakano (Musashi Institute of Technology), Akihide Utani (Musashi Institute of Technology), Arata Miyauchi (Musashi Institute of Technology), Hisao Yamamoto (Musashi Institute of Technology)

**C3L-F4** Chaotic Cyclic Attractors Shift Keying for Low-Rate UWB Communications  
Yanjun Xu (INSA - Toulouse), Pascal Chargé (INSA - Toulouse), Danièle Fournier-Prunaret (INSA - Toulouse)

**C3L-F5** Error-Correcting Method Based on Chaotic Dynamics for Noncoherent Chaos Communications  
Shintaro Arai (Tokushima University), Yoshifumi Nishio (Tokushima University), Takaya Yamazato (Nagoya University)

**C4L-B SPECIAL SESSION: Real-Time and Discrete Event Systems II**

DATE: September 10, 15:40–17:20  
ROOM: Helia Conference Room  
CHAIR: Toshiyuki Miyamoto (Osaka University)

**C4L-B1** A Formula for the Supremal Controllable and Opaque Sublanguage in Discrete Event Systems  
xxxix
Shigemasa Takai (Kyoto Institute of Technology), Yusuke Oka (Kyoto University)

**C4L-B2** Reinforcement Learning of Optimal Supervisor for Timed Discrete Event Systems

Tatsushi Yamasaki (Setsunan University), Toshimitsu Ushio (Osaka University)

**C4L-B3** The Implementability Analysis of Hybrid Controlled Behavior with Discrete Event Controllers in the 2D System Theoretic Framework

Osamu Kaneko (Osaka University), Satoshi Yamamoto (Osaka University)

**C4L-B4** On Particular Solutions for State Equation of Autonomous Continuous Petri Nets

Tadashi Matsumoto (Fukui University of Technology), Masahiro Osogami (Fukui University of Technology), Seiichiro Moro (University of Fukui)

---

**C4L-C SPECIAL SESSION: Verified Bounds in Optimization Problems II**

DATE: September 10, 15:40–17:20
ROOM: Uranus B
CHAIR: Takeshi Ogita (Tokyo Woman’s Christian University)

**C4L-C1** Can Exact Computation Help Optimization?
Daniel Lazard (Université Pierre et Marie Curie - Paris 6 and INRIA)

**C4L-C2** Large Optimization Problems in INTLAB
Siegfried Rump (Hamburg University of Technology)

**C4L-C3** Numerical Verification of Optimum Point in Linear Programming
Shin’ichi Oishi (Waseda University), Kunio Tanabe (Waseda University)

---

**C4L-D Oscillations and Oscillators III**

DATE: September 10, 15:40–17:20
ROOM: Orion
CHAIR: Yoko Uwate (UZH / ETH Zürich)

**C4L-D1** Automatic Selection Method of Some Locomotion Signals in a CPG Network
Tatsuji Tokiwa (Kyushu Institute of Technology), Takeshi Yamakawa (Kyushu Institute of Technology)

**C4L-D2** Coexisting Oscillations in MEMS Pulsed Digital Oscillators
Denis Bourke (University College Dublin), Orla Feely (University College Dublin)
Oscillatory Phenomena in Cellular Neural Network Using Two Kinds of Templates

Junji Fujii (Shikoku University), Yasuteru Hosokawa (Shikoku University), Yoshifumi Nishio (Tokushima University)

Chaotic Oscillations of Noise Suppressed Solid State Lasers Used in Optical-Wireless Networks

Márk Csörnyei (Budapest University of Technology and Economics)

C4L-E Neural Networks IV, Biocybernetics and Bioengineering

DATE: September 10, 15:40–17:20
ROOM: Uranus A
CHAIR: Tadashi Tsubone (Nagaoka University of Technology)

Spatial-Temporal Level Set Algorithms on CNN-UM

Gábor János Tornai (Pázmány Péter Catholic University), Gyögy Cserey (Péter Pázmány Catholic University / Semmelweis University), Ádám Rák (Péter Pázmány Catholic University / ITK)

A Learning Algorithm of Binary Neural Networks Based on Real-Coded GA

Yu Akedo (Musashi Institute of Technology), Hidehiro Nakano (Musashi Institute of Technology), Arata Miyauchi (Musashi Institute of Technology)

Long-Range Dependence of Long-Term Continuous Intracranial Electroencephalograms for Detection and Prediction of Epileptic Seizures

Béla Weiss (Péter Pázmány Catholic University), Zsuzsanna Vágó (Péter Pázmány Catholic University), Ronald Tetzlaff (Technical University Dresden), Tamás Roska (Péter Pázmány Catholic University)

Inferring the Intention of a Crying Baby - Characterization of Painful Cry by Pitch Variation -

Tomomasa Nagashima (Muroran Institute of Technology), Hidenori Tanaka (Muroran Institute of Technology)

C4L-F Communication II

DATE: September 10, 15:40–17:20
ROOM: Venus
CHAIR: Hidehiro Nakano (Musashi Institute of Technology)

RSA Encryption / Decryption Using Repeated Modulus Method

Hasan Oseily (Beirut Arab University), Ali Massoud Haidar (Beirut Arab University)
A Mathematical Approach to Derive Optimum Detector Configurations for UWB Radio Applications

Géza Kolumbán (Budapest University of Technology and Economics), Tamás Krébesz (Budapest University of Technology and Economics), Francis C. M. Lau (Hong Kong Polytechnic University), Chi K. Tse (Hong Kong Polytechnic University)

Mode-Lock Eliminating Timing Synchronization Algorithm for Intervehicle Ad-Hoc Networks

Kenta Shinohara (University of Electro-Communications), Hisa-Aki Tanaka (University of Electro-Communications)

An MC-UWB System with Overlapping Gaussian Subcarriers

Yutaka Jitsumatsu (Kyushu University), Tohru Kohda (Kyushu University)
Author Index

A

Acco, Pascal: 341, B3L-C3(xxix)

Acimovic, Jugoslava: 544, C2L-E2(xxxv)

Adachi, Masaharu: 69, A1L-F2(xix)

Adachi, Yoshinobu: 25, A1L-C4(xviii), 29, A1L-C5(xviii)

Aihara, Kazuyuki: 223, A3L-F1(xxiv), 231, A3L-F3(xxv), 235, A3L-F4(xxv), 269, B2L-C3(xxvii), 464, B4L-E3(xxxiii), 468, B4L-E4(xxxiii), 556, C2L-E5(xxxvi), 564, C2L-F2(xxvii), 568, C2L-F3(xxvvi)

Akedo, Yu: 700, C4L-E2(xli)

Amemiya, Yoshihito: 124, A2L-D4(xxi)

Andrzejak, Ralph: 81, A2L-B1(xix)

Aomori, Hisashi: 261, B2L-C1(xxvi), 357, B3L-D2(xxix), 449, B4L-D3(xxiii), 452, B4L-D4(xxiii), 460, B4L-E2(xxiii)

Aono, Shuichi: 384, B3L-E4(xx)

Arai, Kenichi: 116, A2L-D2(xxii)

Arai, Shintaro: 652, C3L-F5(xxxix)

Asai, Hideki: 353, B3L-D1(xxix), 440, B4L-D1(xxiii)

Asai, Tetsuya: 124, A2L-D4(xxii)

B

Bárhelyi, Balázs: 596, C3L-C2(xxxvii)

Bérci, Norbert: 184, A3L-C2(xxxii)

Bank, Dániel: 108, A2L-C4(xx)

Benner, Hartmut: 207, A3L-E1(xxiv), 416, B4L-B4(xxvi)

Bito, Kensuke: 305, B2L-F4(xxvii)

Bizzarri, Federico: 86, A2L-B3(xx), 277, B2L-E1(xxvii)

Bono, Flavio: 253, B2L-B3(xxvi)

Bourke, Denis: 684, C4L-D2(xl)

Bouzair, Hassane: 341, B3L-C3(xxix)

Bröcker, Jochen: 408, B4L-B2(xxxi)

Brandon, Quentin: 428, B4L-C2(xxxi)

Bumeliene, Skaidra: 309, B2L-F5(xxvii)

C

Carmeli, Cristian: 317, B3L-B2(xxviii)

Chargé, Pascal: 436, B4L-C4(xxxii), 476, B4L-F2(xxxiii), 640, C3L-F2(xxvii), 648, C3L-F4(xxxii)

Chen, Bo: 73, A1L-F3(xix)

Chen, Yanfeng: 337, B3L-C2(xxix)

Chicharro, Daniel: 81, A2L-B1(xxix)

Christen, Markus: 628, C3L-E3(xxxviii)

Chua, Leon: —, A4L-A1(xxv)

Cichocki, Andrzej: 41, A1L-D3(xxvii), 203, A3L-D3(xxiv)

Csörnyei, Márk: 692, C4L-D4(xli)

Csendes, Tibor: 592, C3L-C1(xxxvii), 596, C3L-C2(xxxxvii)

Cseh, Györgyi: 696, C4L-E1(xli)

Csiak, Rudolf: 191, A3L-C4(xxxii)

Czeilinger, Zsolt: 180, A3L-C1(xxxii)

D

Dana, Syamal: 609, C3L-D2(xxxxvii)

Davis, Peter: 116, A2L-D2(xxii)

De Feo, Oscar: 86, A2L-B3(xx)

De Lange, Enno: 329, B3L-B5(xxvii)

Dellnitz, Michael: 313, B3L-B1(xxvii)

Doma, Ryosuke: 568, C2L-F3(xxvii)

E

El Guezar, Fatima: 341, B3L-C3(xxix)

Endo, Tetsuro: 536, C2L-D5(xxxv)

Endo, Yasunori: 49, A1L-E1(xxvii), 396, B3L-F3(xxvii)

F

Fülöp, Tamas: 187, A3L-C3(xxiii)

Feely, Orla: 684, C4L-D2(xl)

Filipposa, Sonja: 249, B2L-B2(xxvii)

Fodor, George: 400, B3L-F4(xxx)
Kanemitsu, Hideo: 156, A2L-F4(xxii)
Kanzawa, Yuchi: 396, B3L-F3(2xxx)
Kashiwagi, Masahide: 512, C2L-C4(2xxxiv)
Kato, Shuzo: 148, A2L-F2(xxii), 456, B4L-E1(2xxxii)
Kawabata, Kuniki: 17, A1L-C2(xxvii)
Kawagoe, Takuro: 33, A1L-D1(xxviii)
Kawamura, Tetsuo: 148, A2L-F2(xxii)
Kelber, Kristina: 37, A1L-D2(xxviii)
Kilic, Recai: 132, A2L-E2(xxvii)
Kimura, Takayuki: 172, A3L-B4(xxiii)
Kitajima, Hiroyuki: 345, B3L-C4(xxix), 432, B4L-C3(3xxi), 520, C2L-D1(xxv)
Kobayashi, Yuta: 73, A1L-F3(xxix)
Kocarev, Ljupco: 249, B2L-B2(xxvii), 564, C2L-E5(xxix)
Kohama, Kengo: 297, B2L-F2(xxvii)
Kohda, Tohru: 564, C2L-F2(xxix), 724, C4L-F1(xxix)
Kohno, Takashi: 556, C2L-E5(xxvi)
Kokame, Hideki: 301, B2L-F3(xxvii), 528, C2L-D3(xxv)
Kolumbán, Géza: 636, C3L-F1(xxviii), 716, C4L-F2(xxix)
Kohima, Masahide: 512, C2L-C4(3xxiv)
Kihara, Shigeo: 148, A2L-F2(xxii)
Kiyama, Hiroyuki: 297, B2L-F2(xxvii)
Kobayashi, Yuta: 73, A1L-F3(xxix)
Kocarev, Ljupco: 249, B2L-B2(xxvii), 253, B2L-B3(xxvi)
Kohama, Kengo: 297, B2L-F2(xxvii)
Kohda, Tohru: 564, C2L-F2(xxvi), 724, C4L-F4(xxii)
Kohno, Takashi: 556, C2L-E5(xxvi)
Kokame, Hideki: 301, B2L-F3(xxvii), 528, C2L-D3(xxv)
Kolumbán, Géza: 636, C3L-F1(xxix), 716, C4L-F2(xxix)
Komatsu, Kazuo: 293, B2L-F1(xxvii)
Konishi, Keiji: 301, B2L-F3(xxvii), 528, C2L-D3(xxv)
Kono, Hideaki: 156, A2L-F4(xxii)
Kono, Hitoshi: 17, A1L-C2(xxvii)
Kousaka, Takuji: 349, B3L-C5(xxix), 428, B4L-C2(xxii)
Koyama, Atsushi: 605, C3L-D1(xxviii)
Krsébesz, Tamás: 636, C3L-F1(xxix), 716, C4L-F2(xxix)
Kucera, Jan: 329, B3L-B5(xxviii)
Kugiumtzis, Dimitris: 325, B3L-B4(xxviii)
Kumagai, Sadatoshi: 588, C3L-B4(xxviii)
Kumeno, Hironori: 128, A2L-E1(xxii)
Kuniihiro, Takashi: 560, C2L-F1(xxvi)
Kurahata, Hiroyuki: 588, C3L-B4(xxviii)
Kurimoto, Kenichi: 500, C2L-B4(xxiv)
Kurisu, Masamitsu: 21, A1L-C3(xxvii)
Kuroda, Taro: 65, A1L-F1(xxix)
Kurths, Jürgen: 412, B4L-B3(xxii)
Kuwazaki, Tatsuya: 472, B4L-F1(xxviii)

L
Lanz, Thomas: 120, A2L-D3(xxii)
Lasztovicza, László: 195, A3L-D1(xxii)
Lazard, Daniel: 672, C4L-C1(xl)
Lebbah, Yahia: 601, C3L-C4(xxvii)
Ledberg, Anders: 81, A2L-B1(xxix)
Li, Xiumin: 172, A3L-B4(xxviii)
Liang, Wei: 94, A2L-B5(xx)
Liu, Xiaofan: 5, A1L-B2(xxvii)

M
Martignoli, Stefan: 361, B3L-D3(xxix)
Marwan, Norbert: 412, B4L-B3(xxix)
Matsuda, Ryo: 496, C2L-B3(xxiv)
Matsuda, Takeshi: 265, B2L-C2(xxvi)
Matsumoto, Tadashi: 369, B3L-D5(xxix), 668, C4L-B4(xxv)
Matsuoka, Yusuke: 136, A2L-E3(xxii), 333, B3L-C1(xxviii)
Matsushita, Haruna: 281, B2L-E2(xxvii), 620, C3L-E1(xxviii)
Matsuura, Takafumi: 77, A1L-F4(xxix), 144, A2L-F1(xxix)
Merkwirth, Christian: 160, A3L-B1(xxii)
Michel, Claude: 601, C3L-C4(xxvii)
Müke, Hidetoshi: 199, A3L-D2(xxiv)
Mishkovski, Igor: 249, B2L-B2(xxvi)
Mitkowski, Pawel: 57, A1L-E3(xxii)
Miura, Kazuyuki: 199, A3L-D2(xxiv)
Miyagawa, Eiji: 227, A3L-F2(xxv)
Miyakoshi, Masaaki: 156, A2L-F4(xxii)
Miyamoto, Goh: 148, A2L-F2(xxii)
Miyamoto, Sadaaki: 396, B3L-F3(xx)
Miyamoto, Toshiyuki: 588, C3L-B4(xxvii)
Miyano, Takaya: 532, C2L-D4(xxv)
Miyata, Arata: 273, B2L-C4(xxvi), 644, C3L-F3(xxvii), 700, C4L-E2(xii)
Mizutani, Shin: 116, A2L-D2(xxii)
Moro, Seichiro: 369, B3L-D5(xxix), 668, C4L-B4(xxv)
Motohashi, Shun: 144, A2L-F1(xxii)
Murashige, Sunao: 211, A3L-E2(xxiv)
Murata, Masayuki: 116, A2L-D2(xxii)
Murata, Yoshitoshi: 148, A2L-F2(xxii), 456, B4L-E1(xxii)
Mykolaitis, Gyntis: 309, B2L-F5(xxvii)
Schwarz, Wolfgang: 337, B3L-C2(xxix)
Sekine, Tadatoshi: 440, B4L-D1(xxxii)
Sekiyama, Ryo: 357, B3L-D2(xxix)
Setti, Gianluca: 444, B4L-D2(xxxii)
Shi, Yuming: 94, A2L-B5(xx)
Shikanai, Takeshi: 584, C3L-B3(xxxvii)
Shima, Daisuke: 261, B2L-C1(xxvi)
Shimada, Yutaka: 140, A2L-E4(xxvi)
Shinohara, Kenta: 720, C4L-F3(xlii)
Shirataki, Jun: 472, B4L-F1(xxxiii)
Sota, Takahiro: 120, A2L-D3(xxi), 361, B3L-D3(xxix), 612, C3L-D3(xxxviii), 628, C3L-E3(xxvii)
Storace, Marco: 86, A2L-B3(xx), 277, B2L-E1(xxvii)
Stroobandt, Dirk: 101, A2L-C2(xx)
Sun, Junfeng: 90, A2L-B4(xx)
Suykens, Johan: 720, C4L-F3(xlii)
Suzuki, Tsuyoshi: 386, B2L-C1(xxvi)
Suzuki, Tomoya: 1, A1L-B1(xvii)
Suzuki, Tsubone: 424, B4L-C1(xxvi)
Suzuki, Tsubone: Tadashi: 444, B4L-D3(xxxii), 452, B4L-D4(xxxii), 460, B4L-E2(xxxii), 560, C2L-F1(xxxvi)
Suzuki, Tomoya: 1, A1L-B1(xvii)
Suykens, Johan: 720, C4L-F3(xlii)
Suzuki, Tsuyoshi: 17, A1L-C2(xvii)
Szolgay, Péter: 184, A3L-C2(xxxiii)

T
Tóth, János: 191, A3L-C4(xxxxii)
Tachibana, Toshihiro: 69, A1L-F2(xix)
Takahashi, Kazunari: 29, A1L-C5(xviii)
Takahashi, Norikazu: 73, A1L-F3(xiii)
Takai, Shigemasa: 656, C4L-B1(xxxix)
Takata, Hitoshi: 293, B2L-F1(xxvii), 297, B2L-F2(xxvii)
Takeda, Ryuzaburo: 504, C2L-B5(xxxxiv)
Takeda, Taichi: 456, B4L-E1(xxxiii)
Takefuji, Yoshiyasu: 239, B1L-A1(xxv)
Tam, Wai M.: 257, B2L-B4(xxvi)
Tamasevicius, Arunas: 309, B2L-F5(xxxvii)
Tamaseviciute, Elena: 309, B2L-F5(xxxvii)
Tamura, Akihisa: 424, B4L-C1(xxxi)
Tanabe, Kunio: 676, C4L-C3(xl)
Tanaka, Gouhei: 468, B4L-E4(xxxxii)
Tanaka, Hidenori: 708, C4L-E4(xli)
Tanaka, Hisa-Aki: 720, C4L-F3(xlii)
Tanaka, Mamoru: 261, B2L-C1(xxvi), 357, B3L-D2(xxix), 448, B4L-D3(xxxii), 452, B4L-D4(xxxii), 460, B4L-E2(xxxii), 560, C2L-F1(xxxvi)
Tani, Yuichi: 353, B3L-D1(xxix)
Taro, Kuroda: 456, B4L-E1(xxxii)
Terada, Sayuri: 576, C3L-B1(xxxvii)
Tetzlaff, Ronald: 704, C4L-E3(xlii)
Timmer, Jens: 82, A2L-B2(xix)
Titchener, Mark: 45, A1L-D4(xviii)
Todoriki, Masaru: 373, B3L-E1(xxx)
Tokiwa, Tatsuji: 680, C4L-D1(xl)
Tomonaga, Shingo: 349, B3L-C5(xxxix)
Tomovski, Igor: 253, B2L-B3(xxxvi)
Toriakai, Hiroyuki: 624, C3L-E2(xxxviii)
Tornai, Gábor János: 696, C4L-E1(xli)
Trajanov, Dimitar: 249, B2L-B2(xxxvi)
Tran, Ha Nguyen: 148, A2L-F2(xxxii)
Tsubone, Tadashi: 500, C2L-B4(xxxxiv)
Tsui, Shigeki: 424, B4L-C1(xxvi)
Tsutsui, Takako: 532, C2L-D4(xxxxv)

U
Uchida, Fuyuki: 49, A1L-E1(xviii)
Uchitani, Yumiko: 377, B3L-E2(xxx)
Ueoka, Yuta: 1, A1L-B1(xvii)
Ueta, Tetsushi: 289, B2L-E4(xxxxii), 424, B4L-C1(xxxi), 428, B4L-C2(xxxi)
Ueyama, Daishin: 696, C4L-E1(xli)
Uemura, Taichi: 215, A3L-B3(xxviii)
Ushio, Toshimitsu: 392, B3L-E2(xxxxii), 456, C2L-B4(xxxxiv)
Ueoka, Yuta: 1, A1L-B1(xvii)
Uchita, Yumiko: 377, B3L-E2(xxx)
Ueta, Tetsushi: 289, B2L-E4(xxxxii), 424, B4L-C1(xxxi), 428, B4L-C2(xxxi)
Ueyama, Daishin: 536, C2L-D5(xxxxvii)
Umezawa, Taichi: 215, A3L-E3(xxiv)
Ushio, Toshimitsu: 392, B3L-E2(xxxxii), 456, C2L-B4(xxxxiv)
Ueoka, Yuta: 1, A1L-B1(xvii)
Utani, Akihide: 644, C3L-F3(xxxxq)
Uwate, Yoko: 219, A3L-E4(xxxxv), 612, C3L-D3(xxxxvii)

V
Vágo, Zsuzsanna: 704, C4L-E3(xlii)
Van Der kloet, Pieter: 61, A1L-E4(xxi)
Vandewalle, Joos: 101, A2L-C2(xx)
Verstraeten, David: 101, A2L-C2(xx)
Vilasis-Cardona, Xavier: 105, A2L-C3(xx)
Vlachos, Ioannis: 325, B3L-B4(xxviii)

W
Wada, Tatsuaki: 488, C2L-B1(xxiv)
Wada, Yasuhiro: 500, C2L-B4(xxiv)
Wakamiya, Naoki: 116, A2L-D2(xxi)
Waning, Nanning: 61, A1L-E4(xix)
Watanabe, Sumio: 265, B2L-C2(xxvi)
Weiss, Béla: 704, C4L-E3(xli)
Werner, Johannes: 416, B4L-B4(xxxi)

X
Xavier-De-souza, Samuel: 101, A2L-C2(xx)
Xu, Xiaoke: 90, A2L-B4(xx)
Xu, Yanjun: 648, C3L-F4(xxxxix)

Y
Yamakawa, Takeshi: 680, C4L-D1(xl)
Yamamoto, Hisao: 644, C3L-F3(xxxix)
Yamamoto, Satoshi: 664, C4L-B3(xl)
Yamanaka, Naoya: 512, C2L-C4(xxiv)
Yamane, Suguru: 616, C3L-D4(xxxviii)
Yamasaki, Tatsushi: 660, C4L-B2(xl)
Yamauchi, Masayuki: 560, C2L-F1(xxxvi), 616, C3L-D4(xxxviii)
Yamazato, Takaya: 652, C3L-F5(xxxix)
Yildirim Dalkiran, Fatma: 132, A2L-E2(xxi)
Yokoyama, Hisashi: 492, C2L-B2(xxiv)
Yoneshima, Hiroko: 301, B2L-F3(xxvii)
Yoshida, Mitsushi: 261, B2L-C1(xxvi)
Yoshimatsu, Kazuhsia: 560, C2L-F1(xxxvi)
Yu, Dongchuan: 9, A1L-B3(xvii)

Z
Zarándy, Ákos: 108, A2L-C4(xx), 187, A3L-C3(xxiii)
Zennyoji, Yuko: 452, B4L-D4(xxxii)
Zhang, Guoqiu: 552, C2L-E4(xxxvi)
Zhang, Jie: 90, A2L-B4(xx), 176, A3L-B5(xxii)
Zhao, Yi: 552, C2L-E4(xxxvi)
Zheng, Xia: 168, A3L-B3(xxii)