

**Information Technology and Bionics
Symposium in Memory of Tamás Roska
23–24 June 2015**

**Faculty of Information Technology and Bionics
Pázmány Péter Catholic University
50/a, Práter utca, 1083 Budapest, Hungary**

– Program –

Tuesday, 23 June 2015

10:00 Opening Speech

Tamás Roska's Memories – Chair: Árpád Csurgay

10:20 **Ágoston Szél:** A Wonderful Journey
10:30 **Marco Gilli:** A Long Term Collaboration in Circuit Theory and Applications Between Hungarian Academy of Science, PPCU and Politecnico di Torino
10:50 **Ferenc Friedler:** 25 Years of Success of the IT Engineering Program Established by Tamás Roska
11:10 **Péter Szolgay:** Tamás Roska Multidisciplinary Doctoral School of Sciences and Technology

11:20 Coffee Break

11:40 Life of Tamás Roska in Pictures
11:50 **István Bárszny:** Memories about Tamás
12:10 **Csaba Rekeczky:** Wave Computing on Silicon: Early Experiments and Long-Term Vision
12:30 **Árpád Csurgay:** Educating Engineers for Nature Inspired Human-Centered Information Technologies and Bionics

12:50 Lunch

Cellular Nonlinear Networks and Visual Computing – Chair: Fernando Corinto

13:40 **Leon Chua:** Everything You Want to Know About Memristors but Are Afraid to Ask
14:00 **Wolfgang Porod:** CNN: Cellular Nanoscale Networks
14:20 **Fernando Corinto:** Memristor-Based Platforms for Pattern Recognition: from Nano-Device to Bio-Inspired Algorithms
14:40 **István Kollár:** Digital Simulation of a Chaotic System
15:00 **Radu Dogaru:** High Productivity Cellular Neural Network Implementation on GPUs Using Python
15:20 **Zoltán Kató:** Sensing the 3D World from 2D Images: Mobile Visual Computations

15:40 Coffee Break

Kilo- and Mega-Processor Architectures and Their Applications – Chair: Ákos Zarányi

16:00 **Müstak Yalcin:** Randomly Reconfigurable Processor Population
16:20 **Ákos Zarányi:** Sense-And-Avoid Algorithms for UAVs and their Implementation on Many-Core Architectures
16:40 **Péter Arató:** System Level Synthesis of Heterogeneous Multiprocessing Architectures
17:00 **Péter Szolgay:** Some Theoretical and Experimental Results on Kilo/Mega-Core Architectures
17:20 **Peter Kilpatrick:** Tamás Roska: Christian, Husband, Father, Grandfather, Friend, Mentor, Intellectual, Researcher, Innovator, Administrator, Visionary
17:40 **Choir of the Faculty:** Musical Performance

18:30 Dinner

Wednesday, 24 June 2015

8.30 **Holy Mass** in Memory of Tamás Roska

9:00 **Welcome Coffee Break**

Circuit Theory and Applications – *Chair: Péter Szolgay*

9:20 **Ronald Tetzlaff:** Real-Time Multivariate Biomedical Signal Processing by Cellular Nonlinear Networks: the Epilepsy Problem
9:40 **Josef Nussek:** Circuits, Systems, Signal Processing and Professor Roska
10:00 **Alon Ascoli:** Synchronization in a Simple Network of Hindmarsh Rose Neurons
10:20 **József Bokor:** Hyperbolic Geometry in the Theory of Circuits and Systems

10:40 **Coffee Break**

Neuroscience Inspired Bionic Engineering – *Chair: Angel Rodriguez-Vazquez*

11:00 **Angel Rodriguez-Vazquez:** Design of Neural Recording Interfaces
11:20 **Botond Roska:** From Retina to Cortex: The Language of Vision
11:40 **Loránd Erőss:** Role of Invasive Neuromodulation in the Treatment of Neurological Disorders
12:00 **József Tar, János Bitó:** Fixed Point Transformation-Based Adaptive Control of the Hodgkin–Huxley Neuron

12:20 **Lunch**

Circuit Theory and Applications – *Chair: Péter Szolgay*

13:00 **János Levendovszky:** Neural-Based Prediction Algorithms for Electronic Trading
13:20 **Katalin M. Hangos, Gábor Szederkényi:** Mass Action Kinetic Representations of Biochemical Reaction Networks
13:40 **Imre Juhász, Ádám Fekete, Árpád Csurgay:** Engineering QED—Quantum Circuits
14:00 **Themis Prodromakis:** Reliably Unreliable Nano-electronics

14:20 **Coffee Break**

Bionic Science and Technology – *Chair: Gábor Próséky*

14:40 **Sándor Pongor:** Bacterial Communities as Mobile Sensor Networks
15:00 **István Ulbert:** Combined Two-Photon Imaging, Electrophysiological and Anatomical Investigation of the Human Neocortex, in Vitro
15:20 **Ferenc Vonderviszt:** Functionalized Flagellar Nanorods for Biosensing Applications
15:40 **Miklós Gyöngy:** The Guidance of Tamás Roska in Our Ultrasound Research
16:00 **Kristóf Karacs:** An Integrated Assistance Tool for Visual Impairment

16:20 **Coffee Break**

16:40 **Gábor Próséky, Borbála Siklósi, Attila Novák:** Processing Ophthalmology Notes
17:00 **Dániel Fabó:** In Vivo, in Vitro Electrophysiological Analysis of the Human Hippocampus
17:20 **Dániel Hillier:** A Causal Link between Computation of Motion Direction in Visual Cortex and Retina
17:40 **Balázs Rózsa:** Multi-Photon Microscopy and New Bionic Research Areas
18:00 **Ferenc Kovács, Ádám Balogh:** Investigation of Fetal Heart Activity Based on a Complex Phonocardiographic Telemonitoring System
18:20 **István Huszár:** Kinetics of Exclusion Zone Formation and Nafion-Induced Acidic Transition

19:00 **Dinner**