

CNNA'06 Mon.Op. 9.00-11.10	Monday 28 August 2006 Opening Sessions	
9.00-9.30	OPENING SPEECH Vedat Tavsanoglu Yildiz Technical University, Istanbul, TURKEY	
9.30-11.10	KEYNOTE SPEECHES Chair: Ahmet Dervisoglu	
9.30-10.20	Cellular Nonlinear Nano-giga-scale Architectures (CNNA)- Converging Sensory Computing Hardware Platforms and Related Wave Logic Inferencing Tamas Roska Hungarian Academy of Sciences, Budapest, HUNGARY	
10.20-11.10	From Photons to Decisions: The CMOS Challenge Angel Rodriguez-Vazquez Instituto de Microelectronica de Sevilla, Centro Nacional de Microelectronica and Universidad de Sevilla, SPAIN	
11.10-11.30	COFFEE BREAK	
	TUTORIALS	
11.30-15.30	CNN Wave Computing: Theory, Architectures, Implementations and Applications Marco Gilli ¹ , Csaba Rekeczky ² , Bertram E. Shi ³ ¹ Politecnico di Torino, ITALY ² Péter Pázmány Catholic University, Faculty of Information Technology, HUNGARY ³ Hong Kong University of Science and Technology, HONG KONG	
11.30-13.00	PART 1 Chair: I. Cem Goknar	
13.00-14.00	LUNCH BREAK	
14.00-15.30	PART 2 Chair: Chagaan Baatar	
15.30-18.05	LIVE CNN TECHNOLOGY DEMO SESSION	
15.30-16.20	PART 1: SHORT INTRODUCTIONS Chair: Csaba Rekeczky	
15.30-15.35	Bioinspired Robotics: Application of a CNN-based CPG VLSI Chip to Control an Autonomous Mini-hexapod Robot Paolo Arena, Luigi Fortuna, Mattia Frasca, Luca Patané, Massimo Pollino ¹ ¹ DIEES University of Catania, ITALY	
15.35-15.40	Cellular Wave Computing the Multi-channel Mammalian Retina Model by the Bi-i Camera-computer David Balya, Botond Roska ¹ ¹ Friedrich Miescher Institute for Biomedical Research, SWITZERLAND	

15.40-15.45	<p>Demonstration of Real-time Image Processing on the SCAMP-3 Vision System Piotr Dudek, David R.W. Barr, Alexey Lopich, Stephen J. Carey¹ ¹ University of Manchester, UK</p>
15.45-15.50	<p>CNNOPT: Learning Dynamics and CNN Chip-specific Robustness Dániel Hillier¹, Samuel Xavier-de-Souza², Johan A. K. Suykens², Joos Vandewalle² ¹ Péter Pázmány Catholic University, HUNGARY ² Katholieke Universiteit Leuven, BELGIUM</p>
15.50-15.55	<p>Computing and Combining the Outputs of Cortically Inspired Feature Maps Bertram E. Shi, Eric K. C. Tsang, Stanley Y. M. Lam, Yicong Meng¹ ¹ Hong Kong University of Science and Technology, HONG KONG</p>
15.55-16.00	<p>A Real-time Mammalian Retina Model Implementation on FPGA Zoltán Nagy¹, Zsolt Vörösházi¹, Péter Szolgay² ¹ Pannon University, Department of Image Processing and Neurocomputing, HUNGARY ² Analogic and Neural Computing Laboratory, Computer and Automation Institute of HAS, HUNGARY</p>
16.00-16.05	<p>Implementation of Cellular Wave Computing Methods by Hardware Learning: Ion Beam Analysis Gunter Geis, Vanessa Senger, Ronald Tetzlaff¹ ¹Institute of Applied Physics, JWG University Frankfurt a. M., GERMANY</p>
16.05-16.10	<p>Multitarget Tracking Applications of the Bi-i Platform: Attention-selection, Tracking and Control Gergely Tímar, Csaba Rekeczky¹ ¹ Péter Pázmány Catholic University, Faculty of Information Technology, HUNGARY</p>
16.10-16.15	<p>Pixel Level Snakes Execution on the SIMD Processor Array Vision Chip SCAMP-3 David Lopez Vilariño¹, Piotr Dudek² ¹ University of Santiago de Compostela, SPAIN ² University of Manchester, UK</p>
16.15-16.20	<p>Fast and Robust Face Tracking Applied to Wheelchair Driving Samuel Xavier-de-Souza, Michiel Van Dyck, Johan A. K. Suykens, Joos Vandewalle¹ ¹ Katholieke Universiteit Leuven, BELGIUM</p>
16.20-16.35	COFFEE BREAK
16.35-18.05	<p>PART 2: LIVE DEMOS Chair: Paolo Arena</p>
20.00-22.00	WELCOME RECEPTION

CNNA'06 Tue.M1 9.00-10.40	Tuesday 29 August 2006 Morning Session 1	
	Tue.M1-a: ADVANCES IN CNN THEORY I Chair: Pier Paolo Civalleri	Tue.M1-b: GENERAL CELLULAR COMPUTING Chair: Marco Gilli
9.00-9.25	Polynomial Discrete Time Cellular Neural Networks to Solve the XOR Problem Eduardo Gomez-Ramirez ¹ , Giovanni Egidio Pazienza ² and Xavier Vilasis-Cardona ² ¹ La Salle University, MEXICO ² Enginyeria I Arquitectura La Salle Universitat "Ramon Llull", SPAIN	Random Number Generator and Monte Carlo type Simulations on the CNN-UM Mária Ercesey-Ravasz ¹ , Tamas Roska ¹ and Zoltán Nédá ² ¹ Peter Pazmany Catholic University, HUNGARY ² Babes-Bolyai University, ROMANIA ,
9.25-9.50	On the Reduction of the Number of Coefficient Circuits in a DTCNN Cell Natalia Abel Fernandez, Victor M. Brea, David Lopez Vilariño and Diego Cabello ¹ ¹ University of Santiago de Compostela, SPAIN	A Programmable Digital Cellular Neural Network Processing On- and Off-Chip Sensory Information Tamás Zeffer ¹ and Timót Hidvégi ² ¹ Péter Pázmány Catholic University, HUNGARY ² Széchenyi István University, HUNGARY
9.50-10.15	Generation of Patterns with Predefined Statistical Properties using Cellular Neural Networks Lukasz Kornatowski ¹ , Krzysztof Slot ¹ , Piotr Debiec ¹ and Hyongsuk Kim ² ¹ Institute of Electronics, Technical University of Lodz POLAND ² Division of Electronics and Information Engineering, Chonbuk National University, REPUBLIC of KOREA	Optical Cellular Wave Computer Implementation and Programming Ahmed Ayoub, Szabolcs Tökés and László Orzó ¹ ¹ MTA-SZTAKI, HUNGARY
10.15-10.40	Spatio-temporal Patterns in CNNs for Classification: the Winnerless Competition Principle Paolo Arena ¹ , Manuel Gonzalez Bedia ² , Luigi Fortuna ¹ , Davide Lombardo ¹ , Luca Patané ¹ and Manuel G. Velarde ² ¹ University of Catania, ITALY ² Universidad Computense de Madrid, SPAIN	Programmable OASLM as a Novel Sensing Cellular Computer Szabolcs Tökés, László Orzó and Ahmed Ayoub ¹ ¹ MTA-SZTAKI, Computer and Automation Research Institute, HUNGARY
10.40-10.55	COFFEE BREAK	

CNNA '06 Tue.M2 10.55-13.00	Tuesday 29 August 2006 Morning Session 2	
	Tue.M2-a: BIONICS AND BIOLOGICALLY RELEVANT MODELS I Chair: Ronald Tetzlaff	Tue.M2-b: APPLICATIONS I Chair: Ari Paasio
10.55-11.20	Estimating Generalized Synchronization in Brain Electrical Activity from Epilepsy Patients with Cellular Nonlinear Networks Dieter Krug, Anton Chernihovskyi, Hannes Osterhage, Christian E. Elger and Klaus Lehnertz ¹ ¹ Department of Epileptology, University of Bonn GERMANY	Acoustic Wave Propagation Modeling on 3D CNN-UM Architecture Péter Sonkoly, Péter Kozma, Zoltán Nagy and Péter Szolgay ¹ ¹ Pannon University, HUNGARY
11.20-11.45	Prediction Error Profiles allowing a Seizure Forecasting in Epilepsy? Christian Niederhoefer, Ronald Tetzlaff ¹ ¹ Institute of Applied Physics, JWG University Frankfurt a. M., GERMANY	Modeling of Elastic Inter-node Bounds in Cellular Neural Network-based Implementation of the Deformable Grid Paradigm Piotr Korbel and Krzysztof Slot ¹ ¹ Institute of Electronics, Technical University of Lodz POLAND
11.45-12.10	Route Number Recognition of Public Transport Vehicles via the Bionic Eyeglass Kristóf Karacs ¹ and Tamas Roska ² ¹ Computer Automation Institute of the Hungarian Academy of Sciences, HUNGARY ² Péter Pázmány Catholic University, HUNGARY	Path Planning of Mobile Robots by Using Cellular Neural Networks Ioan Gavrilut ¹ , Virgil Tiplonut ² and Alexandru Gacsádi ¹ ¹ University of Oradea, ROMANIA ² Politehnica University from Timișoara, ROMANIA
12.10-12.35	Color Processing in Wearable Bionic Eyeglass Robert Wagner and Mihaly Szuhaj ¹ Peter Pázmány Catholic University, HUNGARY ² Hungarian National Association of Blind and Visually Impaired People, Budapest, HUNGARY	CNNOPT: Learning Dynamics and CNN Chip-specific Robustness Dániel Hillier ¹ , Samuel Xavier-de-Souza ² , Johan A.K. Suykens ² , Joos Vandewalle ² ¹ Péter Pázmány Catholic University, HUNGARY ² Katholieke Universiteit Leuven, BELGIUM
12.35-13.00	Human Tested Saliency Map Generation in the Bionic Eyeglass Project Anna Lázár ¹ and Tamas Roska ² ¹ Péter Pázmány Catholic University, HUNGARY ² Computer and Automation Research Institute, Hungarian Academy of Sciences, HUNGARY	A CNN Implementation of the Horn & Schunk Motion Estimation Method Alexandru Gacsádi ¹ , Cristian Grava ¹ , Virgil Tiplonut ² and Péter Szolgay ³ ¹ University of Oradea, Electronics Department ROMANIA , ² "Politehnica", University from Timișoara, Applied Electronics Department, ROMANIA ³ Analogical and Neural Computing Laboratory, Computer and Automation Institute, Hungarian Academy of Sciences, Budapest, HUNGARY
13.00-14.00	LUNCH BREAK	

CNNA'06 Tue.A1 14.00-16.05	Tuesday 29 August 2006 Afternoon Session 1	
	Tue.A1-a: APPLICATIONS II Chair: Radu Dogaru	Tue.A1-b: LINEAR CNN FILTERS Chair: Bertram E. Shi
14.00-14.25	Genetic Programming for the CNN-UM Giovanni Egidio Paziienza ¹ , Eduardo Gomez-Ramirez ² and Xavier Vilasis-Cardona ¹ ¹ Enginyeria i Arquitectura La Salle, Universitat "Ramon Llull", Barcelona, SPAIN ² Universidad "La Salle", México D.F., MEXICO	On the Feature Extraction Performances of CNN Gabor-Type Filters in Texture Recognition Applications Emilian David, Paul Ungureanu and Liviu Goras ¹ ¹ Faculty of Electronics and Telecommunications, „Gh. Asachi” Technical University of Iasi, ROMANIA
14.25-14.50	Analogic Implementation of the Genetic Algorithm David Balya ¹ and Viktor Gal ² ¹ Friedrich Miescher Institute for Biomedical Research SWITZERLAND ² MTA-SZTAKI, HUNGARY	Jacobi's Iterative Method for Solving Linear Equations and the Simulation of Linear CNN Vedat Tavsanoğlu Yildiz Technical University, Istanbul, TURKEY
14.50-15.15	Autonomous Ratio-Memory Cellular Nonlinear Network (ARMCNN) for Pattern Learning and Recognition Chung-Yu Wu and Su-Yung Tsai ¹ ¹ National Chiao-Tung University, TAIWAN	Estimating the CNN Steady State using Forward- Backward Recursions Bertram E. Shi Hong Kong University of Science and Technology HONG KONG
15.15-15.40	Visual Inspection of Metal Objects by using Cellular Neural Networks Zoltan Szlavik ¹ , Ronald Tetzlaff ² , Andreas Blug ³ and Heinrich Hoefler ³ ¹ Analogic and Neural Computing Laboratory, Computer and Automation Research Institute of Hungarian Academy of Sciences, HUNGARY ² Complex Systems Group, Goethe University GERMANY ³ Fraunhofer Institute for Physical Measurement Techniques, GERMANY	Towards Analog VLSI Arrays for Nonseparable 3d Spatiotemporal Filtering Man Den Ip, Emmanuel Michael Drakakis and Anil Anthony Bharath ¹ ¹ Imperial College London, UK
15.40-16.05	Semi-Totalistic CNN Genes for Compact Image Compression Radu Dogaru ¹ , Ronald Tetzlaff ² and Manfred Glesner ³ ¹ University "Politehnica" of Bucharest, ROMANIA ² Johann Wolfgang Goethe-University, Frankfurt am Main, GERMANY ³ Technische Universitaet Darmstadt, GERMANY	
16.05-16.20	COFFEE BREAK	

CNNA'06 Tue.A2 16.20-18.25	Tuesday 29 August 2006 Afternoon Session 2	
	Tue.A2-a: IMPLEMENTATION ISSUES Chair: Péter Szolgay	Tue.A2-b: IMAGE PROCESSING Chair: Hyongsuk Kim
16.20-16.45	A Control System for a Cellular Processor Array David R. W. Barr, Stephen J. Carey, Alexey Lopich and Piotr Dudek ¹ ¹ University of Manchester, UK	Fast and Robust Face Tracking for CNN Chips: Application to Wheelchair Driving Samuel Xavier-de-Souza, Michiel Van Dyck, Johan A.K. Suykens and Joos Vandewalle ¹ ¹ Katholieke Universiteit Leuven, BELGIUM
16.45-17.10	Programmable CNN Cell based on SET Transistors Jacek Flak ¹ , Mika Laiho ² and Kari Halonen ¹ ¹ Helsinki University of Technology, FINLAND ² University of Turku, FINLAND	A New CNN-based Method for Detection of Symmetry Axis Giovanni Costantini ¹ , Daniele Casali ¹ and Roberto Perfetti ² ¹ University of Rome "Tor Vergata", ITALY ² University of Perugia, ITALY
17.10-17.35	Implementation of Nonlinear Template Runner Emulated Digital CNN-UM on FPGA Zoltán Kincses, Zoltán Nagy and Péter Szolgay ¹ ¹ Pannon University, HUNGARY	Pattern Detection in Spectrograms with Cellular Neural Networks Krzysztof Slot ¹ , Piotr Korbel ¹ , Marek Gozdzik and Hyongsuk Kim ² ¹ Institute of Electronics, Technical University of Lodz POLAND ² Division of Electronics and Information Engineering, Chonbuk National University, Jeonju, REPUBLIC of KOREA
17.35-18.00	Multiplexed Circuit for Star-CNN Architecture Fausto Sargeni, Vincenzo Bonaiuto, Maurizio Bonifazi ¹ ¹ Department of Electronic Engineering University of Rome "Tor Vergata", ITALY	A Pattern Classification Method Based on a Space-Variant CNN Template Giovanni Costantini, Daniele Casali and Massimo Carota ¹ ¹ University of Rome "Tor Vergata", ITALY
18.00- 18.25	Programmable Digital Nested CNN Ari Paasio and Jonne Poikonen ¹ ¹ University of Turku, FINLAND	
20.00-24.00	CONFERENCE BANQUET	

CNNA'06 Wed.M1 8.30-11.00	Wednesday 30 August 2006 Morning Session 1	
	Wed.M1-a: ADVANCES IN CNN THEORY II Chair: Angela Slavova	Wed.M1-b: APPLICATIONS III Chair: Mamoru Tanaka
8.30-8.55	N-Scroll Generation in SC-CNN via NeroFuzzy Based Nonlinear Function Enis Gunay, Mustafa Alci and Selami Parmaksizoglu ¹ ¹ Erciyes University Department of Electrical & Electronics Engineering, TURKEY	A Spatial Domain Sigma-Delta Modulator Using Discrete-Time Cellular Neural Networks Hisashi Aomori ¹ , Tsuyoshi Otake ² , Nobuaki Takahashi ³ and Mamoru Tanaka ¹ ¹ Sophia University, JAPAN ² Tamagawa University, JAPAN ³ IBM Japan Ltd., JAPAN
8.55-9.20	An New Automatic Nucleated Cell Counting Method with Improved Cellular Neural Networks (ICNN) Qiang Feng, Shenglin Yu and Huaiyin Wang ¹ ¹ College of Automation Engineering, Nanjing University of Aeronautics and Astronautics, P. R. of CHINA	Implementation of Arbitrary Boolean Functions via CNN Fangyue Chen ¹ , Guolong He ¹ , Guanrong Chen ² and Xiubin Xu ¹ ¹ Zhejiang Normal University, P. R. of CHINA ² City University of Hong Kong, P. R. of CHINA
9.20-9.45	On the Existence of Stable Equilibrium Points in Delayed Cellular Neural Networks Emel Arslan ¹ , Sabri Arik ¹ and Vedat Tavsanoglu ² ¹ Istanbul University, Istanbul, TURKEY ² Yildiz Technical University, Istanbul, TURKEY	Image Resolution Upscaling via Two-Layered Discrete-Time Cellular Neural Network Tsuyoshi Otake ¹ , Takefumi Konishi ¹ , Hisashi Aomori ² , Nobuaki Takahashi ³ and Mamoru Tanaka ² ¹ Tamagawa University, JAPAN ² Sophia University, JAPAN ³ IBM Japan Ltd., JAPAN
9.45-10.10	On the Periodic Solutions in One Dimensional Cellular Nonlinear Networks Based on Josephson Junctions Valeri Mladenov ¹ and Angela Slavova ² ¹ Department Theoretical Electrical Engineering, Faculty of Automatics, Technical University of Sofia BULGARIA ² Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, BULGARIA	A Cellular Active Contours Algorithm Based on Region Evolution Piotr Dudek ¹ and David Lopez Vilariño ² ¹ University of Manchester, UK ² University of Santiago de Compostela, SPAIN
10.10-10.35	Receptor-based CNN Model with Hysteresis for Pattern Formation Angela Slavova ¹ and Maya Markova ² ¹ Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, BULGARIA ² Department of Informatics, University of Russe BULGARIA	Weakly Connected Oscillatory Networks as Associative and Dynamics Memories Fernando Corinto, Michele Bonnin, Marco Gilli and Pier Paolo Civalleri ¹ ¹ Politecnico di Torino - Department of Electronics, ITALY
10.35-11.00	Experiments on Global and Local Adaptation to Illumination Conditions based on Focal-Plane Average Computation Carlos M. Domínguez-Matas, Francisco J. Sánchez-Fernández, Ricardo Carmona-Galán, Elisenda Roca-Moreno ¹ ¹ Instituto de Microelectrónica de Sevilla-CNM-CSIC, SPAIN	Detection of Moving Objects in a Binocular Video Sequence Giovanni Costantini ¹ , Daniele Casali ¹ and Roberto Perfetti ² ¹ University of Rome "Tor Vergata", ITALY ² University of Perugia, ITALY
11.00-11.15	COFFEE BREAK	

CNNA '06 Wed.M2 11.15-13.45	Wednesday 30 August 2006 Morning Session 2	
	Wed.M2-a: BIONICS AND BIOLOGICALLY RELEVANT MODELS II Chair: David Lopez Vilarino	Wed.M2-b: DESIGN METHODS OF CNN ASIPS Chair: Lambert Spaanenburg
11.15-11.40	Space-time Signature Analysis of 2D Echocardiograms Based on Topographic Cellular Active Contour Techniques Zsolt Szálka ¹ , Gergely Soós ¹ , Dániel Hillier ¹ , László Kék ¹ , Csaba Rekeczky ¹ , Gábor Andrassy ² ¹ Péter Pázmány Catholic University, Faculty of Information Technology, HUNGARY ² Saint Francis Hospital, HUNGARY	An Embedded CNN-UM Global Analogic Programming Unit implementation on FPGA Zsolt Vörösházi ¹ , Zoltán Nagy ¹ , András Kiss ¹ and Péter Szolgay ² ¹ Pannon University, Department of Image Processing and Neurocomputing, HUNGARY ² Analogic and Neural Computing Laboratory, Computer and Automation Institute of HAS, HUNGARY
11.40-12.05	Effect of Inhibitory Diffusive Coupling on Frequency-selectivity of Excitable Media Simulated with Cellular Neural Networks Anton Chernihovskyi, Christian E. Elger and Klaus Lehnertz ¹ ¹ Department of Epileptology, University of Bonn GERMANY	FPGA Based Implementation of Water Reinjection in Geothermal Structure Sándor Kocsárdi ¹ , Zoltán Nagy ¹ , Simeon Kostianev ² and Péter Szolgay ¹ ¹ Pannon University, HUNGARY ² University of Mining and Geology, BULGARIA
12.05-12.30	Detecting Structural Alterations in the Brain using a Cellular Neural Network based Classification of Magnetic Resonance Images Florian Döhler, Anton Chernihovskyi, Florian Mormann, Christian E. Elger and Klaus Lehnertz ¹ ¹ Department of Epileptology, University of Bonn GERMANY	In Search for a Robust Digital CNN System WenHai Fang, Cheng Wang and Lambert Spaanenburg ¹ ¹ Department of Information Technology, Lund University, SWEDEN
12.30-12.55	An Autonomous Mini-hexapod Robot Controlled Through a CNN-based CPG VLSI Chip Paolo Arena, Luigi Fortuna, Mattia Frasca, Luca Patané and Massimo Pollino ¹ ¹ DIEES University of Catania, ITALY	Design Method for Unconventional Computing Lambert Spaanenburg ¹ , Benny Akesson ² , Andreas Hansson ² , Kees Goossens ² ¹ Department of Information Technology, Lund University, SWEDEN ² ESAS, Philips Research, NETHERLANDS
12.55-13.20	Vein Feature Extraction using DT-CNNs Suleyman Malki, Yu Fuqiang, Lambert Spaanenburg ¹ ¹ Department of Information Technology, Lund University, SWEDEN	3-Layer CNN Chip for Focal-Plane Complex Dynamics with Adaptive Image Capture Carlos M. Domínguez-Matas, Ricardo Carmona-Galán, Francisco J. Sánchez-Fernández and Angel Rodríguez-Vazquez ¹ ¹ Instituto de Microelectrónica de Sevilla-CNM-CSIC, SPAIN
13.20-13.45	CNNUM-Based Methods Using Deformable Contours on Smooth Boundaries Tamás Szabó ¹ , Péter Szolgay ² ¹ Pannon University, HUNGARY ² Hungarian Academy of Sciences, HUNGARY	An Analog Viterbi Decoder for PRML using Analog Parallel Processing Circuits of the CNN Hyunjung Kim ¹ , Hongrak Son ² , Jeonwon Lee ³ , In-cheol Kim ¹ and Hyongsuk Kim ¹ ¹ Division of Electronics and Information Engineering Chonbuk National University, Jeonju, REPUBLIC of KOREA ² Samsung Advanced Institute of Technology, Yongin REPUBLIC of KOREA ³ Samsung Electronics DM research Center, Suwon, REPUBLIC of KOREA
13.45-14.30	LUNCH BREAK	