

**NASA/ESA Conference on Adaptive Hardware and Systems (AHS-2007)  
August 5-8, 2007, Edinburgh, UK**

**TUTORIALS - SUNDAY, AUGUST 5, 2007**

**TRACK I (Playfair Library)**

- 08:30 - 09:30 Tutorial 1A: Bio-inspired Cellular Architectures**  
Gianluca Tempesti and Andy Tyrrell, The University of York, UK
- 09:30 - 10:30 Tutorial 1B: Basics of Engineering, The Intelligent Hybrid Systems - Implications on Design of the Adaptive Systems**  
Mircea Gh. Negoita, Pertronic Industries Ltd., New Zealand
- 10:30 - 10:50 BREAK**
- 10:50 - 11:50 Tutorial 1C: Self-Repairing and Tuning Reconfigurable Electronics: Real World Applications**  
Didier Keymeulen, NASA Jet Propulsion Laboratory, USA

**TRACK II (Raeburn Room)**

- 08:30 - 09:30 Tutorial 2A: High Performance Reconfigurable Architectures for Adaptable/Evolvable Hardware and Systems**  
Tughrul Arslan, The University of Edinburgh, UK
- 09:30 - 10:30 Tutorial 2B: Reconfigurable Computing**  
Jim Torresen, University of Oslo, Norway

- 12:00 - 12:30 Proceed to PRINCESS STREET for the Festival Celebrations**
- 14:30 Edinburgh Festival Cavalcade Begins**

## MONDAY, AUGUST 6, 2007

08:00 - 09:00	<b>Registration</b>
09:00 - 09:30	<b>Welcome and Organizational Remarks (in Playfair Library)</b>
09:30 - 10:15	<b>Invited Keynote Address (in Playfair Library)</b> Tetsuya Higuchi, National Institute of Advanced Industrial Science and Technology, Japan <i>Real world applications of adaptive and evolvable systems</i>
10:15 - 10:35	<b>BREAK 1</b>

## TRACK I (Playfair Library) - MONDAY, AUGUST 6, 2007

	<b>Session 1A: Special Session on Reconfigurable Antennas</b> <b>Organizer and Chair: Nakul Haridas, University of Edinburgh, UK</b>
10:35 - 11:00	<b>1A1: Wideband Dielectric Resonator Antenna with Reconfigurable Radiation Pattern (Invited)</b> <i>Hazem Fayad, Paul Record (Heriot-Watt University, UK)</i>
11:00 - 11:25	<b>1A2: On the Applications for a Radiation Reconfigurable Antenna (Invited)</b> <i>Tyrone Roach (University of Illinois at Urbana-Champaign, USA), Gregory Huff (Texas A&amp;M University, USA), Jennifer Bernhard (University of Illinois at Urbana-Champaign, USA)</i>
11:25 - 11:50	<b>1A3: Reconfigurable and Adaptive Antennas Using Materials with Variable Conductivity</b> <i>Randy Haupt, Joseph Flemish (The Pennsylvania State University, USA)</i>
11:50 - 12:15	<b>1A4: Multi-Frequency Antenna Design for Space Based Reconfigurable Satellite Sensor Node (Invited)</b> <i>Nakul Haridas, Ahmed El-Rayis, Ahmet T. Erdogan, Tughrul Arslan (University of Edinburgh, UK)</i>
12:15 - 13:30	<b>LUNCH (Provided)</b>
	<b>Session 1B: Special Session on Adaptive Wireless Sensor Networks and Optimisations</b> <b>Organizer and Chair: Erfu Yang, University of Edinburgh, UK</b>
13:30 - 13:55	<b>1B1: Data Requirements from Evolvable Sensor Networks for Homeland Security Problems</b> <i>Sue Ellen Haupt, George Young, Kerrie Long, Anke Beyer (The Pennsylvania State University, USA)</i>
13:55 - 14:20	<b>1B2: Renewal Theory Sleep Time Optimisation for Scheduling Events in Wireless Sensor Networks (Invited)</b> <i>Adrian Udenze, Klaus McDonald-Maier (University of Essex, UK)</i>
14:20 - 14:45	<b>1B3: Characterising Wireless Sensor Motes for Space Applications (Invited)</b> <i>Tanya Vladimirova, Christopher Bridges, George Prassinou, Xiaofeng Wu, Kawsu Sidibeh, David J. Barnhart, Abdul-Halim Jallad, Jean R. Paul, Vaios Lappas (University of Surrey, UK), Adam Baker, Kevin Maynard (Surrey Satellite Technology Limited, UK), Rodger Magness (European Space Agency)</i>
14:45 - 15:05	<b>BREAK 2</b>
15:05 - 15:20 (S)	<b>1B4: Multiobjective Optimal Design of MEMS-Based Reconfigurable and Evolvable Sensor Networks for Space Applications (Invited)</b> <i>Erfu Yang, Nakul Haridas, Ahmed El-Rayis, Ahmet T. Erdogan, Tughrul Arslan, Nick Barton (University of Edinburgh, UK)</i>
	<b>Session 1C: Special Session on Secure Data and Information Systems</b> <b>Organizer and Chair: Ahmed Bouridane, Queen's University Belfast, UK</b>
15:20 - 16:10	<b>Invited Keynote Address</b> <b>Danny Crookes, Queen's University Belfast, UK</b> <i>Following the Footsteps of Others: Techniques for Automatic Shoeprint Classification</i>
16:10 - 16:25 (S)	<b>1C1: Ensuring Data Integrity via ICmetrics Based Security Infrastructure</b> <i>Andrew Hopkins, Klaus McDonald-Maier (University of Essex, UK), Vagelis Papoutsis, Gareth Howells (University of Kent, UK)</i>
16:25 - 16:45	<b>BREAK 3</b>
16:45 - 17:10	<b>1C2: Improving Key Distribution for Wireless Sensor Networks (Invited)</b> <i>Noureddine Mehallegue, Emi Garcia, Ahmed Bouridane (Queen's University Belfast, UK), Qu Gang (University of Maryland, USA)</i>
17:10 - 17:35	<b>1C3: Multiresolution Hybrid Approaches for Automated Face Recognition (Invited)</b> <i>Paul Nicholl (Queen's University Belfast, UK), Abbas Amira (Brunel University, UK), Djamel Bouchaffra (Oakland University, USA), Ronald H. Perrott (Queen's University Belfast, UK)</i>
17:35 - 17:50 (S)	<b>1C4: Normalizing Discrete Circuit Features with Statistically Independent Values for Incorporation within a Highly Secure Encryption System</b> <i>Gareth Howells, Evangelos Papoutsis (University of Kent, UK), Andrew Hopkins, Klaus McDonald-Maier (University of Essex, UK)</i>
17:50 - 18:05 (S)	<b>1C5: AES Embedded Hardware Implementation</b> <i>Mourad Ould-Cheik, Lotfi Si-Mohamed (Ecole Polytechnique, Algeria), Noureddine Mehallegue, Ahmed Bouridane (Queen's University Belfast, UK), Camel Tanougast (Université Henri Poincaré, France)</i>

## TRACK II (Raeburn Room) - MONDAY, AUGUST 6, 2007

### Session 2A: Embryonic Hardware, Morphogenesis

**Chair:** Gianluca Tempesti, University of York, UK

**Co-chair:** Radu Secareanu, Freescale Semiconductor, USA

10:35 - 11:00 **2A1: Application of Self-Configurability for Autonomous, Highly-Localized Self-Regulation**

Nicholas Macias, Peter Athanas (Virginia Polytechnic Institute and State University, USA)

11:00 - 11:25 **2A2: Evolutionary Development of Generic Multipliers: Initial Results**

Michal Bidlo (Brno University of Technology, Czech Republic)

11:25 - 11:50 **2A3: Design of Self-organized Bio-inspired Systems**

André Stauffer, Daniel Mange, Joël Rossier (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

11:50 - 12:15 **2A4: Novel Embryonic Arrays with Neural Network Characteristics**

Mohammad Samie (IRIB, Iran), Gabriel Dragffy, Janice Kiely (University of the West of England, UK)

12:15 - 13:30 **LUNCH (Provided)**

### Session 2B: Evolvable Hardware

**Chair:** Jim Torresen, University of Oslo, Norway

**Co-chair:** Radu Andrei, Plura-tech, USA

13:30 - 13:55 **2B1: Addressing the Metric Challenge: Evolved versus Traditional Fault Tolerant Circuits**

Pauline C. Haddow, Morten Hartmann, Asbjørn Djupdal (Norwegian University of Science and Technology, Norway)

13:55 - 14:20 **2B2: evolFIR: Evolving Redundancy-free FIR Structures**

Szilvia Zvade, Gabriella Kokai (University of Erlangen-Nuremberg, Germany), Robert Vanyi (University of Szeged, Hungary), Hans Holm Frühauf (Fraunhofer IIS, Germany)

14:20 - 14:45 **2B3: MOVES: A Modular Framework for Hardware Evolution**

Paul Kaufmann, Marco Platzner (University of Paderborn, Germany)

14:45 - 15:05 **BREAK 2**

15:05 - 15:30 **2B4: Evolving Redundant Structures for Reliable Circuits -- Lessons Learned**

Asbjørn Djupdal, Pauline C. Haddow (Norwegian University of Science and Technology, Norway)

15:30 - 15:55 **2B5: Online Evolution for a High-Speed Image Recognition System Implemented On a Virtex-II Pro FPGA**

Kyrre Glette, Jim Torresen (University of Oslo, Norway), Moritoshi Yasunaga (University of Tsukuba, Japan)

15:55 - 16:20 **2B6: Extreme Temperature Electronics - From Materials to Bio-inspired Adaptation**

Dragana Laketic, Pauline C. Haddow (Norwegian University of Science and Technology, Norway)

16:20 - 16:45 **BREAK 3**

### Session 2C: Evolutionary and Bio-inspired Search and Optimization Algorithms for Adaptive Hardware

**Chair:** Lukas Sekanina, Brno University of Technology, Czech Republic

**Co-chair:** H.J. Kadim, Liverpool JM University, UK

16:45 - 17:10 **2C1: A Power-Aware Algorithm for the Design of Reconfigurable Hardware during High Level Placement**

Wing On Fung, Tughrul Arslan (University of Edinburgh, UK)

17:10 - 17:35 **2C2: A Multi-objective GA based Physical Placement Algorithm for Heterogeneous Dynamically Reconfigurable Arrays**

Ioannis Nouisias, Sami Khawam, Mark Milward, Mark Muir, Tughrul Arslan (University of Edinburgh, UK)

17:35 - 17:50 (S) **2C3: Solving the Even-n-Parity Problems Using Best SubTree Genetic Programming**

Oana Muntean, Laura Diosan, Mihai Oltean (Babes Bolyai University, Romania)

17:50 - 18:05 (S) **2C4: A Hybrid Engine For the Placement of Domain-Specific Reconfigurable Arrays**

Wing On Fung, Tughrul Arslan, Sami Khawam (University of Edinburgh, UK)

19:00 - 21:00 **Reception and Posters**

## MONDAY, AUGUST 6, 2007 - Playfair Library

19:00 - 21:00 **Reception and Posters (in Playfair Library)**

**Chair:** Ahmet T. Erdogan, University of Edinburgh, UK

**Co-chair:** Nizamettin Aydin, Bahcesehir University, Turkey

**P1: Adaptive Segmentation Technique for Object-Based MPEG-4 System**

Shih-Chang Hsia and Cheng Hung Hsiao (National Kaohsiung First University of Science and Technology, Taiwan)

**P2: Synthesis of Voltage Follower with Only CMOS Transistors Using Evolutionary Methods**

Leonardo Bruno de Sa and Antonio Mesquita (Federal University of Rio de Janeiro, Brazil)

**P3: Multiagent Approach to the Distributed Autonomous Explorations**

Anatoly Melyk, Vadim Golebo, and Alexey Bochkaryov (Lviv Polytechnic National University, Ukraine)

**P4: Novel Content Addressable Memory Architecture for Adaptive Systems**

Xin Yang, Sakir Sezer, John McCanny, and Dwayne Burns (Queen's University Belfast, UK)

**P5: Implementation of Finite State Machines on a Reconfigurable Device**

Graeme Milligan (Institute for System Level Integration, UK) and Wim Vanderbauwhede (University of Glasgow, UK)

**P6: Debug Support for Hybrid SoCs**

Andrew Hopkins and Klaus McDonald-Maier (University of Essex, UK)

**P7: Adaptive and Evolvable Hardware – A Multifaceted Analysis**

Adrian Stoica (JPL, USA) and Radu Andrei (Plura-tech, USA)

**P8: Systolic Array Based Architecture for Variable Block-Size Motion Estimation**

Liang Lu, John McCanny, and Sakir Sezer (Queen's University Belfast, UK)

**P9: Adaptive Facial Behaviour using Selected Machine Learning Methods**

Aleksander Paus, Jim Torresen, and Mats Høvin (University of Oslo, Norway)

**P10: Facial Image Associative Memory Model**

Gorn Tepvorachai and Chris Papachristou (Case Western Reserve University, USA)

**P11: An FPGA Implementation of the HME Self-Synchronizing Stream Cipher**

Camel Tanougast, Serge Weber, Gilles Millerioux (Université Henri Poincaré, France),

Ahmed Bouridane (Queen's University Belfast, UK), and J. Daafouz (Université Henri Poincaré, France)

## TUESDAY, AUGUST 7, 2007

08:00 - 09:00	<b>Registration</b>
09:00 - 09:45	<b>Invited Keynote Address (in Playfair Library)</b> Steve Furber, The University of Manchester, UK <i>Neural Systems Engineering: brain-inspired computing</i>
09:45 - 10:10	<b>BREAK 1</b>

### TRACK I (Playfair Library) - TUESDAY, AUGUST 7, 2007

	<b>Session 1D: Adaptive and Reconfigurable Circuits for Multimedia</b>
	<b>Chair: Martin Margala, University of Massachusetts Lowell, USA</b> <b>Co-chair: Ahmet T. Erdogan, University of Edinburgh, UK</b>
10:10 - 10:35	<b>1D1: A Low Power Implementation of H.264 Adaptive Deblocking Filter Algorithm</b> <i>Mustafa Parlak, Ilker Hamzaoglu (Sabanci University, Turkey)</i>
10:35 - 11:00	<b>1D2: A Configurable IP for Mode Decision of H.264/AVC Encoder</b> <i>Shih-Chang Hsia, Si-Hong Wang and Ying-Chao Chou (National Kaohsiung First University of Science and Technology, Taiwan)</i>
11:00 - 11:25	<b>1D3: H.264/AVC In-Loop De-Blocking Filter Targeting a Dynamically Reconfigurable Instruction Cell Based Architecture</b> <i>Adam Major, Ioannis Nouisias, Sami Khawam, Mark Milward, Ying Yi, Tughrul Arslan (University of Edinburgh, UK)</i>
11:25 - 11:50	<b>1D4: Auto-Adaptive Reconfigurable Architecture for Scalable Multimedia Applications</b> <i>Xun Zhang, Hassan Rabah, Serge Weber (Nancy University, France)</i>
11:50 - 12:15	<b>1D5: A New Reconfigurable Coarse-Grain Architecture for Multimedia Applications (Invited)</b> <i>Martin Margala (University of Massachusetts Lowell, USA), Marco Lanuzza, Stefania Perri, Pasquale Corsonello (University of Calabria, Italy)</i>
12:15 - 13:30	<b>LUNCH (Provided)</b>
	<b>Session 1E: Adaptive and Reconfigurable Circuits for Telecommunications</b>
	<b>Chair: Nizamettin Aydin, Bahcesehir University, Turkey</b> <b>Co-chair: Wim A. Vanderbauwhede, University of Glasgow, UK</b>
13:30 - 13:55	<b>1E1: System Level Reconfigurable FFT Architecture for System-on-Chip Design</b> <i>Ali Ahmadinia, Balal Ahmad, Tughrul Arslan (University of Edinburgh, UK)</i>
13:55 - 14:20	<b>1E2: A Configurable FIR Filter Scheme based on an Adaptive Multilayer Network Structure</b> <i>Gorn Tepvorachai, Chris Papachristou (Case Western Reserve University, USA)</i>
14:20 - 14:35	(S) <b>1E3: Investigation of Reconfigurability for the Digital Backend of Ultra Wideband Receiver</b> <i>Rohit Naik, Jugdutt Singh, Hai Le (La Trobe University, Australia),</i>
14:35 - 14:50	(S) <b>1E4: High Performance Embedded Reconfigurable Concatenated Convolution-Puncturing Fabric for 802.16</b> <i>Ahmed El-Rayis, Tughrul Arslan, Ahmet T. Erdogan (University of Edinburgh, UK)</i>
14:50 - 15:10	<b>BREAK 2</b>
	<b>Session 1F: Adaptive Signal Processing and Sensing</b>
	<b>Chair: Alister Hamilton, Edinburgh University, UK</b> <b>Co-chair: Abbes Amira, Brunel University, UK</b>
15:10 - 15:35	<b>1F1: Analytical Modelling for Adaptive Multi-Purpose On-Chip Optical Interconnect</b> <i>HJ Kadim (Liverpool JM University, UK)</i>
15:35 - 16:00	<b>1F2: DWT Based Adaptive Threshold Determination in Embolic Signal Detection</b> <i>Nizamettin Aydin (Bahcesehir University, Turkey)</i>
16:00 - 16:15	(S) <b>1F3: A Novel Sampling Scheme for Efficient Analog to Digital Conversion</b> <i>Minglang Lin, Ahmet T. Erdogan, Tughrul Arslan (University of Edinburgh, UK), Adrian Stoica (NASA, USA)</i>
16:15 - 16:30	(S) <b>1F4: Predictive Analysis for Robust Operation with Applications to Autonomous Biosensors</b> <i>HJ Kadim (Liverpool JM University, UK)</i>
16:30 - 16:50	<b>BREAK 3</b>
	<b>Session 1G: Design for Adaptive Systems for Space Applications</b>
	<b>Chair: Tanya Vladimirova, University of Surrey, UK</b> <b>Co-chair: Didier Keymeulen, Jet Propulsion Laboratory, USA</b>
16:50 - 17:15	<b>1G1: A Reed-Solomon Algorithm for FPGA Area Optimization in Space Applications</b> <i>Gabriel M. Almeida, Eduardo A. Bezerra, Luis V. Cargnini, Rubem D.R. Fagundes (Catholic University of RS, Brazil), Daniel G. Mesquita (INESC - Instituto Superior Técnico de Lisboa, Portugal)</i>
17:15 - 17:40	<b>1G2: An Adaptive Fault-Tolerant Memory System for FPGA-based Architecture in the Space Environment</b> <i>Dan Fay, Alex Shye, Sayantan Bhattacharya, Daniel Connors (University of Colorado, USA), Steve Wichmann (ReDefine Technologies, USA)</i>
17:40 - 17:55	(S) <b>1G3: Enhancements of Reconfigurable System-on-Chip Data Processing Units for Space Application</b> <i>Björn Osterloh, Harald Michalik, Björn Fiethe, Frank Bubenhausen (IDA Technical University Braunschweig, Germany)</i>
17:55 - 18:10	(S) <b>1G4: Localized Payload Management Approach to Payload Control and Data Acquisition Architecture for Space Applications</b> <i>Ahmed El-Rayis (University of Edinburgh, UK), Anatoly Melnyk (Lviv Polytechnic National University, Ukraine)</i>
20:00 - 23:00	<b>Conference Dinner + Prize Awards (Chair: Martin Suess, European Space Agency)</b>

## TRACK II (Raeburn Room) - TUESDAY, AUGUST 7, 2007

### **Session 2D: On-chip Learning and Adaptation with Analog Circuits**

**Chair: Gareth Howells, University of Kent, UK**

**Co-chair: Peter Athanas, Virginia Tech, USA**

10:10 - 10:35

**2D1: Self-Reconfigurable Analog Arrays: Off-The Shelf Adaptive Electronics for Space Applications**

*Ricardo Zebulum, Mohammad Mojarradi, Adrian Stoica, Didier Keymeulen and Taher Daud (JPL, USA)*

10:35 - 11:00

**2D2: An On-Chip Adaptive Spike Timing Based Offset Cancellation Scheme for Neuromorphic Sensing**

*Thomas J. Koickal, Alister Hamilton (University of Edinburgh, UK)*

11:00 - 11:25

**2D3: On the Design of a Reconfigurable OTA-C Filter for Software Radio**

*Sorin Hintea, Gabor Csipkes, Cristian Rus, Doris Csipkes (Technical University Cluj Napoca, Romania),*

*Hernando Fernandez-Canque (Caledonian University Glasgow, UK)*

11:25 - 11:50

**2D4: A Field Programmable Gm-C Filter Array (FPAA) for Online Adaptation to Environmental Changes**

*Joachim Becker, Stanis Trendelenburg, Fabian Henrici, Yiannos Manoli (Albert-Ludwigs-University, Germany)*

11:50 - 12:15

**2D5: Programmable Analog VLSI Architecture Based upon Event Coding**

*Thomas J. Koickal, Alister Hamilton, Luiz C.P. Gouveia (University of Edinburgh, UK)*

12:15 - 13:30

**LUNCH (Provided)**

### **Session 2F: Special Session on Future and Emerging Technologies**

**Organizer and Chair: Adrian Stoica, Jet Propulsion Laboratory, USA**

13:30 - 13:55

**2F1: PERPLEXUS: Pervasive Computing Framework for Modeling Complex Virtually-Unbounded Systems (Invited)**

*Eduardo Sanchez, Andres Perez-Urbe, Andres Upegui, Yann Thoma (HEIG-VD, Switzerland), Juan Manuel Moreno (UPC, Spain),*

*Alessandro Villa (UJF, France), Henri Volken (UNIL, Switzerland), Andrzej Napieralski (TUL, Poland),*

*Gilles Sassatelli (CNRS, France), Erwan Lavarec (Wany Robotics, France)*

13:55 - 14:20

**2F2: A Novel Hardware Architecture for Self-Adaptive Systems**

*José Antonio Casas, Juan Manuel Moreno, Jordi Madrenas, Joan Cabestany (Technical University of Catalunya, Spain)*

14:20 - 14:45

**2F3: The Perplexus Bio-inspired Reconfigurable Circuit (Invited)**

*Andres Upegui, Yann Thoma, Eduardo Sanchez, Andres Perez-Urbe (HEIG-VD, Switzerland),*

*Juan Manuel Moreno, Jordi Madrenas (Technical University of Catalunya, Spain)*

14:45 - 15:10

**BREAK 2**

### **Session 2G: Special Session on Adaptive Circuits and Systems for IP Networks**

**Organizer and Chair: Sakir Sezer, Queen's University Belfast, UK**

15:10 - 15:35

**2G1: An RDRAM II Implementation of a 10Gbps Shared Packet Buffer for Network Processing (Invited)**

*Ciaran Toal, Dwayne Burns, Kieran McLaughlin, Sakir Sezer, Stephen O'Kane (Queen's University Belfast, UK)*

15:35 - 16:00

**2G2: FPGA-Based Lookup Circuit for Session-Based IP Packet Classification (Invited)**

*Motasem Abdelghani, Sakir Sezer, Emi Garcia, Jun Mu, Ciaran Toal (Queen's University Belfast, UK)*

16:00 - 16:25

**2G3: High-Speed IP Address Lookups Using Hardware Based Tree Structures**

*Kieran McLaughlin, Sakir Sezer (Queen's University Belfast, UK)*

16:25 - 16:50

**BREAK 3**

### **Session 2E: Hardware Implementations of Optimization Engines**

**Chair: Didier Keymeulen, Jet Propulsion Laboratory, USA**

**Co-chair: Erfu Yang, University of Edinburgh, UK**

16:50 - 17:15

**2E1: A Population-Oriented Architecture for Particle Swarms**

*Jorge Peña (Universite de Lausanne, Switzerland), Andrés Upegui (EPFL and HEIG-VD, Switzerland)*

17:15 - 17:40

**2E3: Evaluation of a New Platform for Image Filter Evolution**

*Lukas Sekanina, Zdenek Vasicek (Brno University of Technology, Czech Republic)*

20:00 - 23:00

**Conference Dinner + Prize Awards (Chair: Martin Suess, European Space Agency)**

## WEDNESDAY, AUGUST 8, 2007

08:00 - 09:00	<b>Registration</b>
09:00 - 09:45	<b>Invited Keynote Address (in Playfair Library)</b> Rob Baxter, The University of Edinburgh, UK <i>High-Performance Reconfigurable Computing – The View from Edinburgh</i>
09:45 - 10:10	<b>BREAK 1</b>

## TRACK I (Playfair Library) - WEDNESDAY, AUGUST 8, 2007

	<b>Session 1H: Special Session on High-Performance Reconfigurable Computing</b>
	<b>Organizer and Chair: Khaled Benkrid, University of Edinburgh, UK</b>
10:10 - 10:35	<b>1H1: Programming an FPGA-based Super Computer Using a C-to-VHDL Compiler: DIME-C (Invited)</b> <i>Gildas Ginest, Richard Chamberlain (Nallatech Ltd., UK), Robin Bruce (Institute for System Level Integration, UK)</i>
10:35 - 11:00	<b>1H2: Maxwell – A 64 FPGA Supercomputer (Invited)</b> <i>Robert Baxter, Stephen Booth, Mark Bull, Geoff Cawood, James Perry, Mark Parsons, Alan Simpson, Arthur Trew (University of Edinburgh, UK), Andrew McCormick, Graham Smart, Ronnie Smart (Alpha Data Ltd, UK), Allan Cantle, Richard Chamberlain, and Gildas Genest (Nallatech Ltd, UK)</i>
11:00 - 11:25	<b>1H3: An Engineering Approach to Solving HPC Problems using FPGAs (Invited)</b> <i>Andrew McCormick (Alpha Data Ltd, UK)</i>
11:25 - 11:50	<b>1H4: The FHPCA Parallel Toolkit (Invited)</b> <i>Robert Baxter, Stephen Booth, Mark Bull, Geoff Cawood, James Perry, Mark Parsons, Alan Simpson, Arthur Trew (University of Edinburgh, UK), Andrew McCormick, Graham Smart, Ronnie Smart (Alpha Data Ltd, UK), Allan Cantle, Richard Chamberlain, and Gildas Genest (Nallatech Ltd, UK)</i>
11:50 - 13:30	<b>LUNCH (Provided) + PANEL (Moderator: Adrian Stoica, Jet Propulsion Laboratory, USA)</b>
	<b>Session 1I: Special Session on Reconfigurable Computing Architectures</b>
	<b>Organizer and Chair: Ahmed El-Rayis, University of Edinburgh, UK</b>
13:30 - 13:55	<b>1I1: Automatic generation of ASICs (Invited)</b> <i>Anatoly Melnyk, Andriy Salo (National University "Lviv Politechnics", Ukraine)</i>
13:55 - 14:20	<b>1I2: Synthesis of Multimode digital signal processing systems (Invited)</b> <i>Caaliph Andriamisaina (Université de Bretagne Sud, France), Emmanuel Casseau (Université de Rennes1, France), Philippe Coussy (Université de Bretagne Sud, France)</i>
14:20 - 14:45	<b>1I3: Separation of Data flow and Control flow in Reconfigurable Multi-core SoCs using the Gannet Service-based Architecture (Invited)</b> <i>Wim A. Vanderbauwhede (University of Glasgow, UK)</i>
14:45 - 15:05	<b>BREAK 2</b>
15:05 - 15:30	<b>1I4: DNA and Protein Sequence Alignment with High Performance Reconfigurable Systems (Invited)</b> <i>Mohamed Aboellail, Esam El-Araby, Mohamed Taher, Tarek El-Ghazawi (The George Washington University, USA), Gregory Newby (Arctic Region Supercomputing Center, USA)</i>
15:30 - 15:55	<b>1I5: A Reconfigurable Arithmetic Data-path Based On Regular Interconnection</b> <i>Sotiris Xydīs, George Economakos, Kiamal Pekmestzi (National Technical University of Athens, Greece)</i>
15:55 - 16:20	<b>1I6: A New Behavioural Power Modelling Approach for FPGA based Custom Cores</b> <i>Shrutisagar Chandrasekaran, Abbas Amira (Brunel University, UK)</i>
16:20 - 16:40	<b>BREAK 3</b>
16:40 - 16:55	<b>1I7: A Hardware Preemptive Multitasking Mechanism Based on Scan-path Register Structure for FPGA-based Reconfigurable Systems</b> <i>Slavisa Jovanovic, Camel Tanougast, Serge Weber (Université Henri Poincaré, France)</i>
16:55 - 17:10	<b>(S) 1I8: Hybrid Communication Media for Adaptive SoC Architectures</b> <i>Balal Ahmad, Ali Ahmadinia, Tughrul Arslan (University of Edinburgh, UK)</i>
17:10 - 17:25	<b>(S) 1I9: Automated Integration and Communication Synthesis of Reconfigurable MPSoC Platforms</b> <i>Abdelhalim Samahi, El-Bay Bourennane (Ie2i Laboratory, France)</i>
17:45 - 18:00	<b>Concluding Remarks</b>

## TRACK II (Raeburn ROOM) - WEDNESDAY, AUGUST 8, 2007

### Session 2H: Special Session on Online Monitoring for Adaptive Embedded Systems

**Organizer and Chair: Klaus McDonald-Maier, University of Essex, UK**

- 10:10 - 10:35 **2H1: Trace Algorithms for Deeply Integrated Complex and Hybrid SoCs (Invited)**  
*Andrew Hopkins, Klaus McDonald-Maier (University of Essex, UK)*
- 10:35 - 11:00 **2H2: TRICODA: Complex Data Analysis and Condition Monitoring Based on Neural Network Models (Invited)**  
*Gareth Howells (University of Kent, UK), Bob Howlett (University of Brighton, UK), Klaus McDonald-Maier (University of Essex, UK)*
- 11:00 - 11:25 **2H3: An Embedded Sensor Validation System for Adaptive Condition Monitoring of a Wind Farm (Invited)**  
*Nikolaos Bartzoudis, Klaus McDonald-Maier (University of Essex, UK)*
- 11:25 - 11:50 **2H4: ALT-DVS: Dynamic Voltage Scaling with Awareness of Leakage and Temperature for Real-Time Systems**  
*Lin Yuan (Synopsis Inc, USA), Gang Qu (University of Maryland, USA)*
- 11:50 - 13:30 **LUNCH (Provided) + PANEL (Moderator: Adrian Stoica, Jet Propulsion Laboratory, USA)**

### Session 2I: Special Session on ESPACENET

**Chair: Martin Suess, European Space Agency (ESA), NL**

**Co-chair: Tughrul Arslan, University of Edinburgh, UK**

- 13:30 - 13:55 **2I1: Key Generation for Secure Inter-satellite Communication (Invited)**  
*Evangelos Papoutsis, Gareth Howells (University of Kent, UK), Andrew Hopkins, Klaus McDonald-Maier (University of Essex, UK)*
- 13:55 - 14:20 **2I2: A System Level Framework for Monitoring and Self Diagnosis in ESPACENET (Invited)**  
*Pieter Sartain, Andrew Hopkins (University of Essex, UK), Gareth Howells (University of Kent, UK), Klaus McDonald-Maier (University of Essex, UK)*
- 14:20 - 14:45 **2I3: Distributed Computing in Reconfigurable Pico-Satellite Networks (Invited)**  
*Tanya Vladimirova, Xiaofeng Wu, Abdul-Halim Jallad and Christopher P. Bridges (University of Surrey, UK)*

14:45 - 15:05 **BREAK 2**

### Session 2J: Fault Tolerance and Self-repair

**Chair: Morten Hartmann, Norwegian University of Science and Technology, Norway**

**Co-chair: H. J. Kadim, Liverpool JM University, UK**

- 15:05 - 15:30 **2J1: Automatic Synthesis of Fault Detection Modules for Mobile Robots**  
*Anders Lyhne Christensen, Rehan O'Grady, Mauro Birattari, Marco Dorigo (Université Libre de Bruxelles, Belgium)*
- 15:30 - 15:55 **2J2: Using Relocatable Bitstreams for Fault Tolerance**  
*David Montminy, Rusty Baldwin, Paul Williams, Barry Mullins (Air Force Institute of Technology, USA)*
- 15:55 - 16:20 **2J3: Fault-Recovering Non-FPGA-Based Retargetable Computing System Design**  
*Yong-Kyu Jung (Texas A&M University, USA)*
- 16:20 - 16:40 **BREAK 3**
- 16:40 - 17:05 **2J4: Hierarchical Built-in Self-testing and FPGA Based Healing Methodology for System-on-a-Chip**  
*Sandeep Venishetti, Ali Akoglu, Rahul Kalra (University of Arizona, USA)*
- 17:05 - 17:20 (S) **2J5: A Novel Self-Routing Reconfigurable Fault-Tolerant Cell Array**  
*Xiaoxuan She, Mark Zwolinski (University of Southampton, UK)*
- 17:20 - 17:35 (S) **2J6: Cellular Automata Based Binary Arithmetic for use on Self Repairing, Fault Tolerant Hardware**  
*James Weston, Peter Lee (University of Kent, UK)*

17:45 - 18:00 **Concluding Remarks**