The 37th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2007)

Edinburgh, UK   June 25 – June 28, 2007

Provisional Programme
& Registration Form

Greeting from the General Chair

Corporate industry, business enterprise, national infrastructure, government, private individuals (you, and I) rely more and more upon systems and networks that integrate digital devices and communications with complex software and humans. These systems must maintain safety and confidentiality, be resilient to malicious attacks and accidental faults - indeed, it is essential that they deliver a service that is **dependable** in all respects.

DSN is *the* annual international conference that directly addresses this requirement, presenting research and solutions, and posing new challenges. In 2007 the DSN conference will once again incorporate the Dependable Computing and Communications Symposium (DCCS) and the Performance and Dependability Symposium (PDS), together with tutorials, workshops, student forum, fast abstracts, industry session, and an exhibition of tools and technologies. Additional attractions include a keynote presentation by Prof. Tony Hoare on the need for collusion (not collision!) between Science and Engineering, and a special sessions on the dependability issues arising from the huge ongoing IT project in support of the UK National Health Service.

Above all, delegates will meet, discuss, debate, argue and disagree (for sure) with other professionals who recognise that dependability is the key attribute of a system's function and performance. A welcome reception on the first evening will encourage harmonious interaction; irreconcilable differences will mellow at the Conference Banquet at Stirling Castle.

This is the full Programme for DSN 2007, and provides comprehensive information on what I am sure you will agree will be a very attractive and significant event. The latest updated information is available at http://www.dsn.org – I would like to take this opportunity to invite you to join us in Edinburgh, and I look forward to welcoming you to the Conference towards the end of June 2007.

Prof Tom Anderson,
General Chair DSN 2007

DSN 2007 Sponsors

A very special thanks to all of the **Main Sponsors** of DSN 2007. Without their very generous support we would not be able to offer such an exciting event to our delegates.

Thanks also go to the following institutions for providing generous support to the operation of the conference.

DSN 2007 Vendor Exhibition

A number of tools and service vendors will be exhibiting their products at DSN 2007. The exhibition will be held during the Monday evening reception and throughout the day on Tuesday 26th June. The exhibition will take place in the Cromdale Hall at the EICC.

Organising Committee

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Conference at a Glance

Monday 25th June

0830 – 0900	Tutorial Registration		
0900 - 1230	**Tutorial 1** Surviving Large Scale Failures in the Internet	**Tutorial 2** Model-Based Engineering of Dependable Systems with AADL	
1230 - 1330	Lunch for Tutorial Registrants only		
1330 - 1700	**Tutorial 3** Dependable E-Voting Systems	**Tutorial 4** Software Architectures for Dependable Systems	**Tutorial 5** Robustness Patterns: coping with software bugs at run-time
1800 - 2000	Conference Registration and Welcome Reception		

Tuesday 26th June

0730 - 0830	Registration and Coffee					
0830 - 1000	Opening Ceremony and Keynote Address **Keynote Speaker: Professor Tony Hoare FRS FREng, Microsoft Research** Science and Engineering: a collusion of cultures					
1000 - 1100	Coffee Break and Exhibition					
1100 - 1230	**DCCS 1A** Security Protection: Architectural Approaches	**DCCS 1B** Software Fault Tolerance	**PDS 1C** System Architecture and Software Assessment	**Workshop 1** Dependable Application Support for Self-Organizing Networks	**Workshop 2** Hot Topics in System Dependability	**Fast Abstracts 1**
1230 - 1400	Lunch and Exhibition					
1400 - 1600	**DCCS 2A** Distributed Consensus	**DCCS 2B** Practical Experience Reports	**PDS 2C** Measurements and Monitoring	**Workshop 1** Dependable Application Support for Self-Organizing Networks	**Workshop 2** Hot Topics in System Dependability	**Student Forum 1**
1600 - 1630	Coffee and Exhibition					
1630 - 1800	**DCCS 3A** Embedded Systems	**DCCS 3B** Dependability Modelling	**PDS 3C** Practical Experience Reports	**Workshop 1** Dependable Application Support for Self-Organizing Networks	**Workshop 2** Hot Topics in System Dependability	**Fast Abstracts 2**

Wednesday 27th June

0900 - 1030	**DCCS 4A** Hardware Fault Tolerance: Emerging Challenges	**DCCS 4B** VM Rejuvenation and Network Reliability	**PDS 4C** Distributed Algorithms	**Workshop 3** Architecting Dependable Systems	**Workshop 4** Assurance Cases for Security: The Metrics Challenge	**Fast Abstracts 3**
1030 - 1100	Coffee Break					
1100 - 1300	**DCCS 5A** Soft Errors: Analysis and Protection	**DCCS 5B** Processor Level Fault Tolerance	**PDS 5C** Availability of Distributed Systems	**Workshop 3** Architecting Dependable Systems	**Workshop 4** Assurance Cases for Security: The Metrics Challenge	**Student Forum 2**
1300 - 1400	Lunch					
1400 - 1600	**Plenary Special Session** The National Programme for Information Technology in the UK Health Service: Dependability Challenges and Strategies			**Workshop 3** Architecting Dependable Systems	**Workshop 4** Assurance Cases for Security: The Metrics Challenge	
1630 - 2330	Excursion to Stirling Castle and Conference Dinner					

Thursday 28th June

0900 - 1030	**DCCS 6A** Critical Systems: Risk Analysis and Assurance	**DCCS 6B** Security Threats and Novel Detection	**PDS 6C** Modeling and Evaluation	**Workshop 5** Dependable and Secure Nanocomputing	**Industry Session 1**
1030 - 1100	Coffee Break				
1100 - 1300	**DCCS 7A** Timing Model and Network Protocol	**DCCS 7B** Security Protection: Algorithmic Approaches	**PDS 7C** Quality of Service and Error Recovery	**Workshop 5** Dependable and Secure Nanocomputing	**Industry Session 2**
1300 - 1400	Lunch				
1400 - 1530	**DCCS 8A** Networking	**DCCS 8B** Experimental Dependability Assessment	**PDS 8C** Stochastic Modelling	**Workshop 5** Dependable and Secure Nanocomputing	**Fast Abstracts 4**
1530 - 1600	Coffee Break				
1600 - 1800	IEEE Technical Committee on Dependable Computing and Fault Tolerance Business Meeting (all delegates are invited and welcome to attend)				

Fast Abstracts

Fast Abstracts at DSN are short presentations, either on new ideas or work in progress, or opinion pieces that can address any issue relevant to dependable systems and networks. Fast Abstracts enable their authors to:

- Summarise work that is not yet complete
- Put forward novel or challenging ideas
- State positions on controversial issues
- Suggest new approaches to the solution of open problems

Thus, they provide an excellent opportunity to introduce new work, or present radical opinions, and receive early feedback from the community. A total of 45 Fast Abstracts have been accepted for DSN 2007 and will be presented in four sessions. See www.dsn.org for details of Fast Abstract titles and presenters.

Student Forum

The Student Forum at DSN provides an opportunity for students currently working in the area of dependable computing to present and discuss their research objectives, approach and preliminary results. Two 2 hour sessions at DSN 2007 will be devoted to the Forum, at which 15 graduate students will highlight their research. See www.dsn.org for details of titles and presentations in the Student Forum.

Tutorials

All Tutorials will be held on Monday 28th June. Tutorial registration is from 0830, with morning tutorials starting at 0900. Afternoon tutorials start at 1330. The tutorial registration fee includes lunch on Monday.

Tutorial 1: Surviving Large Scale Failures in the Internet

K. Kant, Intel Corporation, USA

Tutorial Overview:
Although the Internet has so far resisted large scale failures, such outages can happen. The main objective of this tutorial is to examine the impact of large scale failures on internet infrastructure, consider appropriate metrics for routing robustness, and discuss techniques for improving the same.

The tutorial will start with an overview of critical Internet infrastructure elements such as name resolution and routing, and discuss consequences of large scale failures in these. The tutorial shall also provide an overview of some techniques for dealing with these failures. From then on, the tutorial shall focus primarily on inter-AS routing in the Internet and robustness issues of border gateway protocol (BGP). The topics discussed in some detail include (a) routing structure in terms of provider-customer relationships and policies. (b) performance of inter-AS routing under both isolated and large scale failures, and (c) previous work on improving BGP for isolated failures.

We then launch into large scale failures from the perspective of what a "large scale failure" means, what's important under a large scale failure, how BGP behaves and what can we do about it. In particular, we demonstrate several techniques for improving BGP convergence delay and show the improvement via detailed simulation models. We also consider the critical issue of what are the appropriate metrics for characterising inter-AS routing performance in the internet both for isolated and large scale failures. We show that convergence delay is not the right metric and show results relative to a few alternative metrics. Finally, we discuss a variety of open issues on improving robustness of routing in the Internet.

The tutorial will provide the attendee an overview of impact of large scale failures on the Internet and a through understanding of how the inter-domain routing will be affected by it and what can we do about it.

Tutorial 2: Model-Based Engineering of Dependable Systems with AADL

D Gluch, SEI/Embry-Riddle Aeronautical University, USA and B Lewis, Amry AMCOM SED, USA

Tutorial Overview:
The tutorial provides experiences using the SAE Architecture Analysis & Design Language (AADL) standard for high dependability system analysis and design. Attendees will learn key elements of the AADL and how to apply them in the design and analysis of dependable computer systems. Representative avionics and related application examples using the Open Source AADL Tool Environment (OSATE) are used as demonstrations of the AADL in action. The capabilities to specify fault handling, redundancy, fault tolerance, and related high dependability design aspects are highlighted. In addition, the AADL Error Model Annex Standard reliability modeling language and its application in dependable system design are presented.

Structure of the Tutorial:
The tutorial will be conducted in two sessions that focus on the high dependability design and analysis capabilities of the AADL and supporting toolset. In the sessions, the AADL is presented as part of model-based and architecture-driven development. A focus is maintained on how the AADL's precisely defined semantics can specify and facilitate the analysis of important performance-critical and dependability considerations such as timing, schedulability, fault and error handling, time and space partitioning, and safety properties. Employing pedagogical examples, the initial sections of the tutorial introduce key AADL language constructs and demonstrate the features, capacities, and use of the open source OSATE toolset. Throughout the remainder of the tutorial, both slide presentations and examples are used to explore the specification, analysis, and prediction capabilities of the AADL. These demonstrate how AADL-based modeling and pattern-based architectural analysis can identify shortcomings in a design, provide a framework for fault-tolerance, allow trade-offs across multiple performance critical and reliability qualities of an architecture, and establish a foundation for model-based design and analysis throughout the lifecycle of a dependable system. A laptop computer is not required. However, if a participant wishes to complete the examples with the instructor using a laptop, the OSATE software must be downloaded from the AADL web site (www.aadl.info) prior to the tutorial.

Tutorial 3: Dependable E-Voting Systems
P. Ryan, Newcastle University, UK

Tutorial Overview:
Confidence in voting systems has been badly shaken in recent years, in particular in the wake of the 2000 and 2004 US elections, but also by the many reports of elections throughout the world whose accuracy and probity has been questioned.

Researchers have been pursuing the goal of high assurance, verifiable voting schemes. A number of schemes have emerged in the last few years that are reaching a sufficient level of maturity for them to be seriously considered for deployment in real elections and referenda.

The problem with most existing voting technologies is that voters (and election officials) have to place a high degree of trust in the underlying technology, software etc. The challenge is to provide voting systems that enable voters to confirm that their vote is accurately included in the count whilst not providing them any way to prove to a third party how they voted. Furthermore, this should be achieved without the voter needing to place any trust in officials, software or hardware.

In this tutorial I will describe the requirements of such schemes and the challenges that achieving them pose. Having laid the ground by outlining the various cryptographic primitives that are required and threats that need to be countered, I will then present the Pret a Voter scheme.

Tutorial 4: Software Architectures for Dependable Systems
R. de Lemos, University of Kent, UK, C. Gacek, Newcastle University, UK and A-E. Rugina, LAAS-CNRS, France

Tutorial Overview:
The *aim* of this tutorial is to provide an insight on how the structuring of software systems at the architectural level is fundamental for the development of dependable systems. Taking as a basis the different dependability means, we show how dependability should be considered at the architectural level, and the impact this should have when developing dependable systems. Existing architectural approaches do not provide the necessary means for reasoning about dependability, hence the need to know what are the general principles associated with software architectures, what is being developed in terms of dependability means, and what are the challenges lying ahead. The main *objectives* of this tutorial are the following:

- to establish the major principles associated with software architectures and dependability that are relevant when reasoning about faults at the architectural level;
- to introduce and discuss existing approaches for architecting dependable systems;
- to identify the main challenges that lie ahead when considering the structuring of dependable systems at the architectural level.

At the end of the tutorial, the participants should have a better appreciation of the challenges, problems and solutions that are currently associated with the structuring of dependable systems at the architectural level. These should include methods, techniques, and tools that are relevant in the context of dependability means, mainly, rigorous design, fault tolerance and system evaluation. The level of this tutorial is basic, and there are no special prerequisites, since we are dealing with fundamental concepts from two different disciplines, that of software architectures and dependability. However, some of the approaches to be presented would be state-of-the-art for motivating future directions of research. The tutorial includes the discussion of some case studies to help clarify issues and solidify concepts discussed.

Tutorial 5: Robustness Patterns: coping with software bugs at run-time
P. Felber, University of Neuchatel, Switzerland and C. Fetzer, Dresden University of Technology, Germany

Tutorial Overview:
Only for the most safety-critical applications can we expect, or at least hope, that few or no faults remain in software deployed to the field. For most other domains, a variety of economical and technical factors lead to the deployment of software that contains faults, i.e., software bugs. For example, time-to-market requirements might demand the shipment of premature software and only during the lifetime of a system does the software dependability need to increase.

In this tutorial, we will present several widely used robustness patterns that were introduced over the last few decades. A first focus will be on mechanisms that have been successfully applied in practice. A second focus is on recently proposed patterns like Rx or Failure Oblivious computing.

The purpose of this tutorial is first to give practitioners a good overview of robustness patterns to improve the dependability of software, and second to give graduate students and researchers an up-to-date overview of the current research in this field.

Workshops

Workshop 1: Dependable Application Support for Self-Organizing Networks

The aim of this workshop is to provide a forum for researchers to focus on challenges in hosting sophisticated distributed applications in the emerging class of self-organised networks such as MANETs, sensor and P2P networks.

The topics of interest are, but not limited to:

- Novel applications and their dependability requirements;
- Consensus in MANETs and P2P networks;
- Self-stabilisation in Sensor networks;
- Algorithms for sensor coverage;
- Protocol evaluation and 3-D Simulations;
- Data Dissemination and aggregation;
- Security Issues in Self-Organised Networking Contexts.

Workshop 2: Hot Topics in System Dependability

The goals of HotDep'07 are to bring forth cutting-edge research ideas spanning the domains of fault tolerance/reliability and systems, and to build linkages between the two communities (e.g., between people who attend traditional "dependability" conferences such as DSN and ISSRE, and those who attend "systems" conferences such as OSDI, SOSP, and EuroSys).

Possible topics include but are not limited to the following:

- automated failure management, enabling systems to adapt on the fly to changes or exceptional conditions;
- techniques for better detection, diagnosis, or recovery from failures;
- forensic tools for use by administrators and programmers after a failure or attack;
- techniques and metrics for quantifying aspects of dependability in specific domains (e.g., measuring the security, scalability, responsiveness, or other properties of a software service);
- tools/concepts/techniques for optimizing tradeoffs among availability, performance, correctness, and security;
- novel uses of technologies not originally intended for dependability (e.g., using virtual machines to enhance dependability);
- advances in the automation of management technologies, such as better ways to specify management policy, advances on mechanisms for carrying out policies, or insights into how policies can be combined or validated.

Workshop 3: Architecting Dependable Systems

The aim of the workshop is to bring together the communities of software architectures and dependability to discuss the state of research and practice when dealing with dependability issues at the architecture level. We are interested in submissions from both industry and academia on all topics related to software architectures for dependable systems. These include, but are not limited to:

- Rigorous design: architectural description languages; architectural patterns; formal development; architectural views; architectural support for evolution; integrators (wrappers) for dependability; representation of fault assumptions;

- Verification & validation: architectural inspection techniques; theorem proving; type checking; model checking; architecture-based fault injection; architecture-based conformance testing; simulation;

- Fault tolerance: redundancy and diversity at the architectural level; error confinement; architectural monitoring; dynamically adaptable architectures; exception handling in software architectures; tolerating architectural mismatches; architectural support for self-healing, self-repairing, self-stabilizing systems; support for adaptable fault tolerance;

- System evaluation: assurance based development; dependability modeling and analysis in software architectures; run-time checks of dependability models at the architectural level; tradeoff between dependability and cost;

- Enabling technologies: model driven architectures; component based development; aspects oriented development; middleware;

- Application areas: safety-critical systems; critical infrastructures; mobile systems; service oriented architectures; embedded systems.

Workshop 4: Assurance Cases for Security: The Metrics Challenge

The workshop will identify state of the practice in metrics for assurance cases in the context of security, identify promising ways forward and research directions. The workshop will produce the following outputs:

1. Identification of the candidate metrics for assurance cases for security and the characteristics which those metrics must posses.

2. A listing of the major classes of evidence for assurance cases for security and a mapping of classes of evidence to metrics.

3. Candidate methods for combining the various classes of evidence toward the desired system security properties.

Workshop 5: Dependable and Secure Nanocomputing

The Workshop is aimed at characterizing these impairments and threats as well as distinguishing possible alternative design approaches and operation control paradigms that have to be enforced and/or favored in order to keep achieving dependable and secure computing. Three main goals were identified for the Workshop:

1. Review the state-of-knowledge concerning the issues at stake in nanocomputing technologies: manufacturing faults, accidental operational faults, malicious attacks (trusted and intrusion tolerant devices).

2. Identify existing solutions attached to various design options for mitigating faults and implementing secure and resilient computing devices and systems.

3. Forecast the risks associated to emerging technologies and foster new trends for cooperative work, possibly combining various alternatives to help increase the pace of advances and solutions.

Industry Session

Chair: Lisa Spainhower, IBM, USA

Plenary Special Session

The National Programme for Information Technology in the UK Health Service: Dependability Challenges and Strategies

Chair: Brian Randell,
Newcastle University, UK

The National Health Service (NHS) provides the majority of health-care in the UK. Its main section, that for England, serves a population of over 50 million, employs 40,000 general practitioners (family physicians), 80,000 other doctors, and 350,000 nurses, and includes over 300 hospitals.

The NHS National Programme for Information Technology (NPfIT) is the largest civil IT project in the world. (Estimates of its total cost have ranged from £6.2 billion up to £20 billion.) This project, which was launched in 2002, aims to implement electronic care records for all patients and to provide a reliable and secure information service, for medical records, radiography, patient administration, etc., for all the hospitals, and all general practitioners' premises, to which all the NHS health professionals in England will have strictly-controlled access. This Special Plenary Session will provide an overview of NPfIT, and its dependability challenges and strategies.

Speakers will, it is hoped, include representatives of Connecting for Health (the NHS Agency responsible for NPfIT), the medical profession, and the dependability research community.

Monday 25th June

0830 – 0900	**Tutorial Registration**

0900 – 1200   **Tutorial 1:**   **Surviving Large Scale Failures in the Internet**
K. Kant, Intel Corporation, USA

                       Tutorial 2:   **Model-Based Engineering of Dependable Systems with AADL**
D Gluch, SEI/Embry-Riddle Aeronautical University, USA and B Lewis, Amry AMCOM SED, USA

1230 - 1330	**Lunch for Tutorial Registrants only**

1330 - 1700   **Tutorial 3:**   **Dependable E-Voting Systems**
P. Ryan, Newcastle University, UK

                       Tutorial 4:   **Software Architectures for Dependable Systems**
*R. de Lemos, University of Kent, UK, C. Gacek, Newcastle University, UK
and A-E. Rugina, LAAS-CNRS, France*

                       Tutorial 5:   **Robustness Patterns: coping with software bugs at run-time**
P. Felber, University of Neuchatel, Switzerland and C. Fetzer, Dresden University of Technology, Germany

1800 - 2000	**Conference Registration and Welcome Reception**

Tuesday 26th June

0730 – 0830	**Registration and Coffee**

0830 – 1000	**Opening Ceremony and Keynote Address**

                       Keynote Speaker: *Professor Tony Hoare FRS FREng, Microsoft Research*
Science and Engineering: a collusion of cultures

1000 - 1100	**Coffee Break and Exhibition**

1100 - 1230   **DCCS 1A:**
Session Chair: *Mohammad Zulkernine, Queens University, Ontario, Canada*

Security Protection: Architectural Approaches
Augmenting Branch Predictor to Secure Program Execution
Yixin Shi and Gyungho Lee, University of Illinois at Chicago, Chicago, IL, USA

A Firewall for Routers: Protecting Against Routing Misbehavior
Ying Zhang, Zhuoqing Morley Mao, University of Michigan, Ann Arbor, MI, USA, Jia Wang, AT&T Labs-Research, USA

An Architectural Approach to Preventing Code Injection Attacks
Ryan Riley, Purdue University, West Lafayette, IN, USA, Xuxian Jiang George Mason University, Fairfax, VA, USA, Dongyan Xu, Purdue University, West Lafayette, IN, USA

DCCS 1B:
Session Chair: *David Taylor, University of Waterloo, Canada*

Software Fault Tolerance
Failure Resilience for Device Drivers
Jorrit N. Herder, Herbert Bos, Ben Gras, Philip Homburg and Andrew S. Tanenbaum, Vrije Universiteit, Amsterdam, Netherlands

Fault Tolerance Connectors for Unreliable Web Services
Nicolas Salatge, Jean-Charles Fabre, LAAS-CNRS, Toulouse, France

Robustness and Security Hardening of COTS Software Libraries
Martin Süßkraut and Christof Fetzer, Technische Universität Dresden, Germany

PDC 1C:
Session Chair: *Sy-Yen Kuo, National Taiwan University, Taiwan*

System Architecture and Software Assessment
Multi-core Lifetime Reliability Modeling and Analysis
Jeonghee Shin, Victor Zyuban, Zhigang Hu, Jude Rivers and Pradip Bose, IBM T. J. Watson Research Center, Yorktown Heights, NY, USA

Processor-level Selective Replication
Nithin Nakka, Karthik Pattabiraman and Ravishanker Iyer, University of Illinois at Urbana-Champaign, IL, USA

Robustness Testing of the Windows DDK
Manuel Mendonça and Nuno Neves, University of Lisboa, Lisboa, Portugal

Workshop 1: Dependable Application Support for Self-Organizing Networks

Workshop 2: Hot Topics in System Dependability

Fast Abstracts 1

1230 - 1400	**Lunch and Exhibition**

1400 - 1600   **DCCS 2A:**
Session Chair: *Hari Govind Ramasamy, IBM Zürich, Switzerland*

Distributed Consensus
Automatic Verification and Discovery of Byzantine Consensus Protocols
Piotr Zielinski, University of Cambridge, Cambridge, UK

Knowledge Connectivity vs. Synchrony Requirements for Fault-Tolerant Agreement in Unknown Networks
Fabíola Greve, Federal University of Bahia, Bahia, Brazil Sébastien Tixeuil, Université Paris-Sud, Orsay, France

Communication Predicates: A High-level Abstraction for Coping with Transient and Dynamic Faults
Martin Hutle and André Schiper, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland

Synchronous Consensus with Mortal Byzantines
Josef Widder, Günther Gridling, Bettina Weiss, Vienna University of Technology, Vienna, Austria, Jean-Paul Blanquart, Astrium Satellites, France

DCCS 2B:
Session Chair: *Rick Buskens, Lockheed Martin, USA*

Practical Experience Reports
Reliability Techniques for RFID-Based Object Tracking Applications
Ahmad Rahmati, Rice University, Houston, TX, USA, Matti Hiltunen, Rittwik Jana, AT&T Labs – Research, Florham Park, NJ, USA, Lin Zhong, Rice University, Houston, TX, USA

Profiling Attacker Behavior Following SSH Compromises
Daniel Ramsbrock, Robin Berthier and Michel Cukier, University of Maryland, College Park, MD, USA

Dependability Assessment of Grid Middleware
Nik Looker and Jie Xu, University of Leeds, Leeds, UK

Assessing Robustness of Web-services Infrastructures
Marco Vieira, Nuno Laranjeiro and Henrique Madeira, University of Coimbra, Portugal

Protecting Cryptographic Keys From Memory Disclosure Attacks
Keith Harrison and Shouhuai Xu, University of Texas, San Antonio, TX, USA

PDS 2C:
Session Chair: *Ludmila Cherkasova, HP Labs, USA*

Measurements and Monitoring
SLAM: Sleep-Wake Aware Local Monitoring in Sensor Networks,
Issa Khalil, Saurabh Bagchi, Ness B. Shroff, Purdue University, West Lafayette, IN, USA

What Supercomputers Say: A Study of Five System Logs
Adam Oliner, Stanford University, Stanford, CA, USA and Jon Stearley, Sandia National Laboratories, USA

How do Mobile Phones Fail? A Failure Data Analysis of Symbian OS Smart Phones
*Marcello Cinque, Domenico Cotroneo, Università di Napoli, Napoli, Italy Zbigniew Kalbarczyck and
Ravishankar Iyer, University of Illinois at Urbana-Champaign, IL, USA*

A Real-time Network Traffic Profiling System
*Kuai Xu, Feng Wang, University of Minnesota, Minneapolis, MN, USA Supratik Bhattacharyya, Sprint ATL, USA Zhi-Li
Zhang, University of Minnesota, Minneapolis, MN, USA*

Workshop 1: Dependable Application Support for Self-Organizing Networks

Workshop 2: Hot Topics in System Dependability

Student Forum 1

1600 - 1630	**Coffee and Exhibition**

1630 - 1800   **DCCS 3A: Session Chair:** *Philip Koopman, Carnegie Mellon University, USA*

Embedded Systems
Fault Tolerant Planning for Critical Robots
*Benjamin Lussier, Matthieu Gallien, Raja Chatila, Jérémie Guiochet, Felix Ingrand, Marc-Olivier Killijian and
David Powell, LAAS-CNRS, Toulouse, France*

Insights into the Sensitivity of the BRAIN (Braided Ring Availability Integrity Network)
Michael Paulitsch and Brendan Hall, Honeywell Aerospace, Minneapolis, MN, USA

A Tunable Add-On Diagnostic Protocol for Time Triggered Systems
*Marco Serafini, Darmstadt University of Technology, Germany, Jonny Vinter, SP, Sweden Astrit Ademaj, TU Vienna, Austria
Fulvio Tagliabò, Fiat, Italy Jens Koch, Airbus Deutschland, Germany Wolfgang Brandstätter, Audi, Germany Neeraj Suri,
Darmstadt University of Technology, Germany*

DCCS 3B: Session Chair: *Aad van Moorsel, Newcastle University, UK*

Dependability Modelling
Enhanced Reliability Modeling of RAID Storage Systems
Jon Elerath, Network Appliance, Inc., Sunnyvale, CA, USA, Michael Pecht, University of Maryland, College Park, MD, USA

On a Modeling Framework for the Analysis of Interdependencies in Electrical Power Systems
*Silvano Chiaradonna, CNR-ISTI, Pisa, Italy Paolo Lollini, University of Florence, Florence, Italy Felicita Di Giandomenico,
CNR-ISTI, Pisa, Italy*

PDS 3C: Session Chair: *Marco Vieira, University of Coimbra, Portugal*

Practical Experience Reports
RAS by the Yard
Alan Wood and Swami Nathan, Sun Microsystems, Inc., Santa Clara, CA, USA

Web Services Wind Tunnel: On Performance Testing Large-Scale Stateful Web Services
*Marcelo De Barros, Jing Shiau, Kenton Gidewall, Chen Shang, Joe Forsmann and Hui Shi, Microsoft Corporation, Redmond,
WA, USA*

Application of Software Watchdog as a Dependability Software Service for Automotive Safety Relevant Systems
*Xi Chen, DaimlerChrysler AG, Germany Juejing Feng, RWTH Aachen, Aachen, Germany Martin Hiller, Volvo Technology
Corporation, Gothenburg, Sweden Vera Lauer, DaimlerChrysler AG, Germany*

Workshop 1: Dependable Application Support for Self-Organizing Networks

Workshop 2: Hot Topics in System Dependability

Fast Abstracts 2

Wednesday 27th June

0900 - 1030

DCCS 4A:
Session Chair: *Johan Karlsson, Chalmers University, Sweden*

Hardware Fault Tolerance: Emerging Challenges
Superscalar Processor Performance Enhancement Through Reliable Dynamic Clock Frequency Tuning
Viswanathan Subramanian, Mikel Bezdek, Naga Durgaprasad Avirneni and Arun Somani, Iowa State University, Ames, IA, USA

Determining Fault Tolerance of XOR-based Erasure Codes Efficiently
Jay J. Wylie and Ram Swaminathan, HP Labs, Palo Alto, CA, USA

Fault Tolerant Approaches for Nanoelectronic Logics
Wenjing Rao, Alex Orailoglu and Ramesh Karri, University of California, San Diego, CA, USA

DCCS 4B:
Session Chair: *Matti Hiltunen, AT&T Labs Research, USA*

VM Rejuvenation and Network Reliability
Concilium: Collaborative Diagnosis of Broken Overlay Routes
James Mickens and Brian Noble, University of Michigan, Ann Arbor, MI, USA

R-Sentry: Providing Continuous Sensor Services Against Random Node Failures
Shengchao Yu and Yanyong Zhang, Rutgers University, Piscataway, NJ, USA

A Fast Rejuvenation Technique for Server Consolidation with Virtual Machines
Kenichi Kourai and Shigeru Chiba, Tokyo Institute of Technology, Tokyo, Japan

PDS 4C:
Session Chair: *Michel Raynal, IRISA, Université de Rennes, France*

Distributed Algorithms
Evaluating the Impact of Simultaneous Round Participation and Decentralized Decision on the
Performance of Consensus
Lívia Sampaio, Universidade Federal de Campina Grande, Brazil Michel Hurfin, IRISA - INRIA, Rennes, France Francisco Brasileiro, Universidade Federal de Campina Grande, Brazil Fabíola Greve, Universidade Federal da Bahia, Brazil

On the Cost of Modularity In Atomic Broadcast
Olivier Rütti, Ecole Polytechnique Fédérale de Lausanne, Switzerland Sergio Mena, University of York, UK Richard Ekwall and André Schiper, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Eventually k-Bounded Wait-Free Distributed Daemons
Scott Pike and Yantao Song, Texas A&M University, College Station, TX, USA

Workshop 3: Architecting Dependable Systems

Workshop 4: Assurance Cases for Security: The Metrics Challenge

Fast Abstracts 3

1030 - 1100   **Coffee Break**

1100 - 1300

DCCS 5A:
Session Chair: *AJ Klein Osowski, IBM, USA*

Soft Errors: Analysis and Protection
A Cost-Effective Dependable Microcontroller Architecture with Instruction-Level Rollback
for Soft Error Recovery
Teruaki Sakata, Teppei Hirotsu, Hiromichi Yamada, Hitachi Research Laboratory, Hitachi Ltd., Hitachi-shi, Japan Takeshi Kataoka, Standard Product Business Group, Renesas Technology Corp., Japan

Architecture-Level Soft Error Analysis: Examining the Limits of Common Assumptions
Xiaodong Li, Sarita Adve, University of Illinois at Urbana Champaign, IL, USA, Pradip Bose and Jude Rivers, IBM T.J. Watson Research Center, Yorktown Heights, NY, USA

Feedback Redundancy: A Power Efficient SEU-Tolerant Latch Design for Deep Sub-Micron Technologies
Mahdi Fazeli, Ahmad Patooghy, Seyed Ghassem Miremadi and Alireza Ejlali, Sharif University of Technology, Tehran, Iran

Using Register Lifetime Predictions to Protect Register Fles Against Soft Errors
Pablo Montesinos, Wei Liu and Josep Torrellas, University of Illinois at Urbana Champaign, IL, USA

DCCS 5B:
Session Chair: *Cristian Constantinescu, Advanced Micro Devices, AMD, USA*

Processor Level Fault Tolerance
Using Process-Level Redundancy to Exploit Multiple Cores for Transient Fault Tolerance
Alex Shye, Tipp Moseley, Vijay Janapa Reddi and Daniel Connors, University of Colorado at Boulder, CO, USA

Inherent Time Redundancy (ITR): Using Program Repetition for Low-Overhead Fault Tolerance
Vimal Reddy and Eric Rotenberg, North Carolina State University, Raleigh, NC, USA

Utilizing Dynamically Coupled Cores to Form a Resilient Chip Multiprocessor
Christopher LaFrieda, Engin Ipek, Jose Martinez and Rajit Manohar, Cornell University, Ithaca, NY, USA

BlackJack: Hard Error Detection with Redundant Threads on SMT
Ethan Schuchman and T. N. Vijaykumar, Purdue University, West Lafayette, IN, USA

PDS 5C:
Session Chair: *Paul Ezhilchelvan, Newcastle University, UK*

Availability of Distributed Systems
Measuring Availability in Optimistic Partition-tolerant Systems with Data Constraints
Mikael Asplund, Simin Nadjm-Tehrani, Linköping University, Sweden Stefan Beyer and Pablo Galdamez, Universidad Politcnica de Valencia, Spain

Scaling and Continuous Availability in Database Server Clusters through Multiversion Replication
Kaloian Manassiev and Cristiana Amza, University of Toronto, Canada

Improving Recoverability in Multi-tier Storage Systems
Marcos K. Aguilera, Kimberly Keeton, Arif Merchant, Kiran-Kumar Muniswamy-Reddy and Mustafa Uysal, Hewlett-Packard Laboratories, Palo Alto, CA, USA

Portable and Efficient Continuous Data Protection for Network File Servers
Ningning Zhu and Tzicker Chiueh, Stony Brook University, Stony Brook, NY, USA

Workshop 3: Architecting Dependable Systems

Workshop 4: Assurance Cases for Security: The Metrics Challenge

Student Forum 2

1300 - 1400	**Lunch**

1400 - 1600 **Plenary Special Session: Chair:** Brian Randell, Newcastle University, UK

The National Programme for Information Technology in the UK Health Service: Dependability Challenges and Strategies

Workshop 3: Architecting Dependable Systems

Workshop 4: Assurance Cases for Security: The Metrics Challenge

1630 - 2330	**Excursion to Stirling Castle**

The conference excursion and dinner will be via the famous Edinburgh Bridges where we will stop to view the Edinburgh Suspension Road Bridge and the Forth Railway Bridge, before continuing our journey to Stirling Castle. On arrival DSN delegates will have exclusive access to the castle and royal apartments. Dinner will be held in the Great Hall and Royal Chapel.

Stirling Castle is one of the grandest castles in Britain due to its imposing position and impressive architecture. It towers over some of the most important battlefields of Scotland's past including Stirling Bridge, the site of William Wallace's victory over the English in 1297, and Bannockburn where Robert the Bruce defeated the same foe in the summer of 1314. The castle became a strategic military key to the kingdom during the 13th and 14th century and was the favourite royal residence of many of the Stuart Monarchs. Many important events from Scotland's past took place at Stirling Castle, including the violent murder of the eighth Earl of Douglas by James II in 1452. The castle also played an important role in the life of Mary, Queen of Scots. She spent her childhood in the castle and Mary's coronation took place in the Chapel Royal in 1543.

0900 - 1030

DCCS 6A:
Session Chair: *Jean-Claude Laprie, LAAS-CNRS, France*

Critical Systems: Risk Analysis and Assurance
Confidence: Its Role in Dependability Cases for Risk Assessment
Robin Bloomfield, Bev Littlewood and David Wright, City University, London, UK

Assurance Based Development of Critical Systems
Patrick Graydon, John Knight, University of Virginia, Charlottesville, VA, USA Elisabeth Strunk, The Aerospace Corporation, USA

DCCS 6B:
Session Chair: *Paolo Verissimo, University of Lisboa, Portugal*

Security Threats and Novel Detection
Multiprocessors May Reduce System Dependability under File-based Race Condition Attacks
Jinpeng Wei and Calton Pu, Georgia Institute of Technology, Atlanta, GA, USA

Understanding Resiliency of Internet Topology Against False Origin Attacks
Mohit Lad, Ricardo Oliveira, University of California, Los Angeles, CA, USA Beichuan Zhang, University of Arizona, Tucson, AZ, USA Lixia Zhang, University of California, Los Angeles, CA, USA

User Discrimination through Structured Writing on PDAs
Rachel R. M. Roberts, Roy A. Maxion, Kevin S. Killourhy, and Fahd Arshad, Carnegie Mellon University, Pittsburgh, PA, USA

PDS 6C:
Session Chair: *Boudewijn Haverkort, University of Twente, Netherlands*

Modeling and Evaluation
Variational Bayesian Approach for Interval Estimation of NHPP-based Software Reliability Models
Hiroyuki Okamura, Hiroshima University, Japan Michael Grottke, Duke University, Durham, NC, USA Tadashi Dohi, Hiroshima University, Japan Kishor Trivedi, Duke University, Durham, NC, USA

Dynamic Fault Tree Analysis Using Input/Output Interactive Markov Chains
Hichem Boudali, Pepijn Crouzen and Marielle Stoelinga, University of Twente, Netherlands

Uniformity by Construction in the Analysis of Nondeterministic Stochastic Systems
Holger Hermanns and Sven Johr, Universität des Saarlandes, Saarbrücken, Germany

Workshop 5: Dependable and Secure Nanocomputing

Industry Session: 1
Session Chair: *Lisa Spainhower, IBM, USA*

1030 - 1100 **Coffee Break**

1100 - 1300

DCCS 7A:
Session Chair: *Santosh Shrivastava, Newcastle University, UK*

Timing Model and Network Protocol
How to Choose a Timing Model?
Idit Keidar and Alexander Shraer, Technion, Haifa, Israel

Electing an Eventual Leader in an Asynchronous Shared Memory System
Antonio Fernandez, Universidad Rey Juan Carlos, Móstoles, Spain, Ernesto Jimenez, Universidad Politécnica de Madrid, Madrid, Spain Michel Raynal, IRISA, Université de Rennes, Rennes, France

Minimizing Response Time for Quorum-System Protocols over Wide-Area Networks
Florian Oprea and Michael Reiter, Carnegie Mellon University, Pittsburgh, PA, USA

HyParView: A Membership Protocol for Reliable Gossip-based Broadcast
João Leitão, University of Lisbon, Portugal José Pereira, University of Minho, Braga, Portugal Luís Rodrigues, University of Lisbon, Portugal

DCCS 7B:
Session Chair: *Nuno Neves, University of Lisboa, Portugal*

Security Protection: Algorithmic Approaches
A Lightweight Mechanism for Dependable Communication in Untrusted Networks
Michael Rogers, UCL, London, UK Saleem Bhatti, University of St Andrews, St Andrews, UK

Dynamic Cross-Realm Authentication for Multi-Party Web Service Interactions
Dacheng Zhang, Jie Xu, University of Leeds, UK Xianxian Li, Beihang University, China

Enhancing DNS Resilience against Denial of Service Attacks
Vasileios Pappas, T.J. Watson Center IBM Research, Hawthorne, NJ, USA Dan Massey, Colorado State University, Fort Collins, CO, USA Lixia Zhang, University of California, Los Angeles, CA, USA

Automatic Cookie Usage Setting with CookiePicker
Chuan Yue, Mengjun Xie and Haining Wang, College of William and Mary, Williamsburg, VA, USA

PDS 7C:
Session Chair: *Arun Somani, Iowa State University, USA*

Quality of Service and Error Recovery
A Reinforcement Learning Approach to Automatic Error Recovery
Qijun Zhu, Tianjin University, Beijing, China Chun Yuan, Microsoft Research Asia, Beijing, China

On the Quality of Service of Crash-Recovery Failure Detectors
Tiejun Ma, Jane Hillston and Stuart Anderson, University of Edinburgh, Edinburgh, UK

E2EProf: Automated End-to-End Performance Management for Enterprise Systems
Sandip Agarwala, Fernando Alegre, Karsten Schwan, Georgia Institute of Technology, Atlanta, GA, USA Jegannathan Mehalingham, Delta Air Lines, Atlanta, GA, USA

Bounding Peer-to-Peer Upload Traffic in Client Networks
Chun-Ying Huang and Chin-Laung Lei, National Taiwan University, Taipei, Taiwan

Workshop 5: Dependable and Secure Nanocomputing

Industry Session 2: Session Chair: *Lisa Spainhower, IBM, USA*

1300 - 1400	**Lunch**

1400 - 1530	**DCCS 8A: Session Chair:** *Douglas Blough, Georgia Institute of Technology, USA*

Networking
Greedy Receivers in IEEE 802.11 Hotspots
Mi Kyung Han, Brian Overstreet and Lili Qiu, University of Texas at Austin, TX, USA

Emergent Structure in Unstructured Epidemic Multicast
Nuno Carvalho, Jose Pereira, Rui Oliveira, University of Minho, Braga, Portugal Luis Rodrigues, University of Lisbon, Portugal

The Case for FEC-based Reliable Multicast in Wireless Mesh Networks
Dimitrios Koutsonikolas and Yu Charlie Hu, Purdue University, West Lafayette, IN, USA

DCCS 8B: Session Chair: *Dong Tang, Sun Microsystems, USA*

Experimental Dependability Assessment
On the Selection of Error Model(s) For OS Robustness Evaluation
Andréas Johansson, Neeraj Suri, Darmstadt University of Technology, Germany Brendan Murphy, Microsoft Research, Cambridge, UK

Foundations of Measurement Theory Applied to the Evaluation of Dependability Attributes
Andrea Bondavalli, Andrea Ceccarelli, Lorenzo Falai, University of Florence, Florence, Italy Michele Vadursi, University of Naples "Parthenope," Naples, Italy

Component Risk Assessment and Comparison Using Software Fault Injection
Regina Moraes, State University of Campinas, São Paulo, Brazil João Durães, University of Coimbra, Portugal Ricardo Barbosa, Critical Software SA, Coimbra, Portugal Eliane Martins, State University of Campinas, São Paulo, Brazil Henrique Madeira, University of Coimbra, Portugal

Thursday 28th June continued

PDS 8C:
Session Chair: *Tadashi Dohi, University of Hiroshima, Japan*

Stochastic Modeling
Performability Models for Multi-Server Systems with High-Variance Repair Durations
Imad Antonios, Southern Connecticut State University, New Haven, CT, USA and Hans-Peter Schwefel, Center for Teleinfrastruktur Aalborg University, Aalborg, Denmark

Computing Battery Lifetime Distributions
Lucia Cloth, Boudewijn R. Haverkort and Marijn Jongerden, University of Twente, Twente, Netherlands

Quantifying the Effectiveness of Mobile Phone Virus Response Mechanisms
Elizabeth Van Ruitenbeek, Tod Courtney, University of Illinois at Urbana-Champaign, IL, USA, Fabrice Stevens, France Telecom Research, Issy les Moulineaux, France and William Sanders, University of Illinois at Urbana-Champaign, IL, USA

Workshop 5: Dependable and Secure Nanocomputing

Fast Abstracts 4

1530 - 1600	**Coffee Break**

1600 - 1800   **IEEE Technical Committee on Dependable Computing & Fault Tolerance Business Meeting**
(all delegates are invited and welcome to attend)

Local Information

Venue

The DSN 2007 conference will be held at the EICC, the Edinburgh International Conference Centre, a superb modern conference facility. The EICC is located in the heart of Scotland's capital city, within walking distance of a range of hotels to suit all budgets.

Edinburgh is now officially the 9th most popular conference destination in the world and the UK's top city destination. The Guardian's Annual Survey of UK Travel Destinations has named Edinburgh as top UK City for the 4th year running.

Car Parks

There are five car parks all within two to five minutes' walking distance from the EICC.

Weather

Weather in the UK does have quite a reputation, which is largely justified so, if you are not familiar with it, it is worth being prepared (for anything). Realistically, in late June a temperature of 15° Centigrade counts as cold and 30° counts as hot. You might hope for daytime temperatures in the low 20s. However, since we are not very far from the Atlantic Ocean and the North Sea, rain is likely, but by no means inevitable; in summer there may be thunderstorms and hail is not impossible. Sunny weather is not unheard of; it's recently become a bit warmer, a bit drier and (perhaps) even more unpredictable.

Currency

Pound sterling (£) is the UK currency. Please note Scotland has its own distinctive banknotes, which are legal tender throughout the UK. Sterling travellers' cheques can be cashed at all banks, post offices and most travel agents and hotels. Most ATM machines will accept Visa and MasterCard credit cards for cash withdrawals, though such transactions will usually incur a charge.

Visas

Visitors from some countries outside the European Union may require a visa to enter the UK. For information on this, please visit the Foreign Office website at http://www.fco.gov.uk.

Electricity

British electrical standards are 50Hz, 240 Volts. Appliances set up for 110/125V will require a transformer if they don't already have built-in voltage adjustment. Britain also uses a specific 3-prong plug.

Smoking

Since Spring 2006 there has been a complete smoking ban in all public places in Scotland.

Transportation

Rail Travel

From London (Kings Cross Station). Trains leave approximately every 30 minutes to Edinburgh Waverley Station in the City centre – journey time approximately four and a half hours.

From Glasgow (Queen Street Station). Trains run regularly every 30 minutes; journey time just over one hour, to either Edinburgh (Haymarket) – nearest station to the EICC – or Edinburgh (Waverley)

Air Travel

Edinburgh Airport

Edinburgh Airport is approximately 12 miles from the city centre. Many major European cities have flights to Edinburgh, including Amsterdam, Barcelona, Brussels, Cologne, Frankfurt, Geneva, Helsinki, Madrid, Milan, Munich, Pisa, Rome and Warsaw. There is one international flight per day from each of New York and Toronto.

There is also an extremely frequent service from London Heathrow, Gatwick and Stansted airports. An Airlink bus service operates frequently from the airport to the city centre. Tickets cost £3 and are available on the bus. Journey time approximately 25 minutes. There is also a shuttle bus service between the airport and Edinburgh city centre. Taxis cost £20 to the city centre.

Glasgow Airport

Glasgow airport is approximately 50 miles from Edinburgh. Glasgow also has flights from many European cities, but is served by more US and international carriers than Edinburgh – flights daily from Calgary, Dubai, Halifax, Lahore, Las Vegas, New York, Orlando, Ottawa, Philadelphia, Toronto and Vancouver. Take a taxi or coach to Glasgow centre, for Queen Street train station. Take the train either to Edinburgh Haymarket (nearest station to EICC), or Edinburgh Waverley stations. Trains run approximately every 30 minutes.

Conference Registration Desk

The registration desk for DSN 2007 will be located in the main foyer (Strathblane Hall) of the EICC from 0830 Monday 25th June through to 1600 on Thursday 28th June.

Further Information

Please direct all queries to either Joan Atkinson (joan.atkinson@ncl.ac.uk) or Claire Smith (claire.smith@ncl.ac.uk), either via telephone +44 191 221 2222 or +44 191 222 7999 or via fax to +44 191 222 7995 or +44 191 222 8788.

Sightseeing

Make the most of your visit to Edinburgh with some unmissable city highlights:

Edinburgh Castle - The Castle dominates Edinburgh wherever you are in the city and every visitor should visit the Castle, not only because of the historical interest of this remarkable fortress and former royal residence, but because it offers such splendid panoramic views of the city. Edinburgh Castle is also the home of the One O'Clock Gun. This is fired every day except Sunday at precisely 1.00p.m. to provide everyone with an accurate check for their clocks and watches. It will certainly startle you if you are anywhere near the Castle at that moment!

Architecture - The UNESCO World Heritage Site at the heart of the city combines the medieval Old Town, the Georgian New Town and award winning modern architecture. A stroll through the city's streets reveal Edinburgh's timeless elegance, steeped in history. From the castle dominating the heart of the city, to the new Scottish Parliament building, classic architecture abounds.

Whisky - The Scotch Whisky Heritage Centre is located in the Royal Mile in the centre of Edinburgh. The centre organizes a tour through the different processes that are followed to produce Scotch Whisky. The centre has a large collection (around 270) of different single malt and blended whiskies.

City Tour - Let the professionals guide you around the city; choose from an open top bus, a walking or cycling tour or an atmospheric ghost tour of the Old Town. All city bus tours leave from Waverley Bridge and you can buy a hop-on, hop-off ticket which lasts 24 hours. Ghost tours are generally concentrated around the Old Town. Tickets can be bought directly or at the Tourist Information Centre on top of Waverley Mall, at 3 Princes Street.

Museums & Galleries – Edinburgh's world-ranking museums and galleries tell the story of a fascinating past mixed with contemporary exhibitions. Choose from national collections and international blockbusters to more intimate spaces and exhibits. Home to Scotland's five National Galleries and Scotland's National Museum, there's always a number of events and exhibitions to choose from, all year round.

The Da Vinci Code

The action of Dan Brown's bestseller The Da Vinci Code culminates at Rosslyn Chapel http://www.rosslynchapel.org.uk – built by the Knights Templar, supposedly the final resting place of the Holy Grail, and easily accessible from DSN 2007!

Guided tours which include Rosslyn Chapel are operated by Timberbush Tours; these depart from central Edinburgh on Mondays and Thursdays http://www.timberbush-tours.co.uk/edinburgh_tours/one_day/rosslyn_chapel.html

Alternatively the Chapel can be reached on any day by the local bus service http://www.lothianbuses.co.uk/r15.html.

"Every surface in the chapel has been carved with symbols - Christian cruciforms, Jewish stars, Masonic seals, Templar crosses, cornucopias, pyramids, astrological signs, plants, vegetables, pentacles and roses. The Knights Templar had been master stonemasons, erecting Templar churches all over Europe, but Rosslyn was considered their most sublime labour of love and veneration."

(The Da Vinci Code - Dan Brown)

Registration Information

Payment

Please make cheques payable to: "Newcastle University". All cheques must be in GBP (£). Cancellations must be received in writing (email or fax is acceptable) and received before 15th June. Cancellations are subject to a £30 processing fee. Substitutions are allowed at ay time.

Direct transfers are an acceptable form of payment but are not considered paid until received by our bank. For transfer details, please contact Claire Smith (claire.smith@ncl.ac.uk).

To qualify for the advance registration discount, booking form and payment must be received by the deadline (May 22nd 2007). Registrations received after the deadline will be charged at the late/on-site rate.

Registration Confirmation

Confirmation of your registration will be emailed by one of the local arrangements team within 7 days of receiving your registration. If you do not receive your confirmation, please send an email to Claire Smith (claire.smith@ncl.ac.uk).

Member, Emeritus and Student Discounts

To qualify for the discounted Member rates, you must be a member of the IEEE or the IEEE Computer Society and include your membership number, or be a member of IFIP WG 10.4.

Retired staff are eligible for the Emeritus discount rate.

To qualify for the Student discount rate you must be a full time student and show your student ID at registration.

On-site Registration

On-site registrants will pay the late registration fees. Cash or cheque (in UK pounds £) is the preferred form of payment. Credit cards will also be accepted. Direct transfer will not be accepted on-site.

Cancellations and Substitutions

Cancellations and substitutions are allowed. However, full registration fees will be charged unless the cancellation notice is sent in writing (email or fax is acceptable), and received before the deadline of 15th June 2007. A £30 handling fee will be charged to all cancellations. Fees will not be refunded after the cancellation deadline.

Substitutions are allowed at any time upon receipt of a written letter (email or fax is acceptable) providing information on the replacement.

Please send any cancellations or substitution notifications to: Joan Atkinson, CSR, Newcastle University, Claremont Tower, Newcastle upon Tyne, NE1 7RU, UK. Or via email to joan.atkinson@ncl.ac.uk or via fax to +44 191 222 7995.

Questions

Please direct all registration related questions to Joan Atkinson, joan.atkinson@ncl.ac.uk,
telephone +44 191 221 2222 or via fax +44 191 222 7995.

DSN-2007 REGISTRATION FORM

Fax or post this form to the address shown on the right.
Alternatively, register on-line at
http://www.dsn.org/registration.htm
All payments must be made in pounds sterling

Joan Atkinson
Centre for Software Reliability
Newcastle University
Newcastle upon Tyne, NE1 7RU, UK
Email: Joan.Atkinson@ncl.ac.uk
Fax: +44 191 222 7995
Tel: +44 191 221 2222

REGISTRATION DETAILS

Name:..

Organisation/Affiliation: ....

Address:..

....

Daytime Phone: .... Fax:...

Special Dietary Needs:.. Email: ....

METHOD OF PAYMENT (please circle one)   Mastercard   Visa   American Express

Credit Card Number: .... Expiry date: .... Security Code:...........................

Cardholder Name:.. Signature:...

❑   Please invoice my company (Please supply billing information including VAT number)   ❑   I enclose a cheque in £ sterling (Cheques should be made payable to: Newcastle University)

Total Cost: ....

❑   I am eligible for discount rate: Member IEEE/IEEECS#_____   Emeritus_____   Student_____

DSN Conference Registration for Members, Non-Members, Emeritus includes attendance at all DCCS and PDS sessions and Workshops (Tuesday-Thursday), Monday welcome reception, breaks, lunches, excursion and banquet, proceedings on CD and the Supplemental Volume. **Student Registration** includes attendance at all DCCS and PDS sessions and Workshops (Tuesday-Thursday), Monday welcome reception, breaks, proceedings on CD and the Supplemental Volume.

Advance (on or before May 22)			**Late/On-site (after May 22)**		
❑	Member	£390	❑	Member	£490
❑	Non-Member	£490	❑	Non-Member	£615
❑	Student Member	£220	❑	Student Member	£280
❑	Student Non-Member	£275	❑	Student Non-Member	£350
❑	Emeritus	£275	❑	Emeritus	£350

Additional adult tickets for Excursion & Banquet
Dinner at Stirling Castle (Wednesday 27th June)   £70: Number required:_____
Reduced rate child ticket (Children's Menu)   £25: Number required:_____
Hard copy of conference proceedings   £30: Number required:_____

Single Day Workshop Only Registration (includes the single day workshop of your choice, Monday welcome reception, breaks, lunch on the day of the workshop, and the Supplemental Volume).

❑ Workshop 1 (DASSON) ❑ Workshop 2 (Hotdep)   ❑ Workshop 3 (WADS)   ❑ Workshop 4 (Assurance) ❑ Workshop 5 (Nano)

Advance (on or before May 22)			**Late/On-site (after May 22)**		
❑	Member	£170	❑	Member	£200
❑	Non-Member	£215	❑	Non-Member	£250

Tutorial Registration **(includes the chosen tutorial(s), Monday Welcome Reception, Monday breaks, lunch and handouts. Choose one morning and/or one afternoon tutorial:**
❑ **Tutorial 1**   ❑ **Tutorial 2**   ❑ **Tutorial 3**   ❑ **Tutorial 4**   ❑ **Tutorial 5**

Advance (on or before May 22)		**Late/On-site (after May 22)**	
Member:	❑ 1 tutorial £90 ❑ 2 tutorials £150	Member:	❑ 1 tutorial £110 ❑ 2 tutorials £170
Non-Member:	❑ 1 tutorial £115 ❑ 2 tutorials £190	Non-Member:	❑ 1 tutorial £140 ❑ 2 tutorials £220

CITY CENTRE MAP

EDINBURGH INTERNATIONAL CONFERENCE CENTRE

The main entrance to the EICC is on **Morrison Street** where there is a coach drop off point.

Access to the EICC Loading Bay (deliveries only) is from the **West Approach Road**.

There are a number of car parks within walking distance of the EICC, they are marked on the map. For further details on car parking please visit our website.

Please note that there are a number of one way streets in close proximity to the EICC.

After 18.30 street parking is allowed in certain areas.

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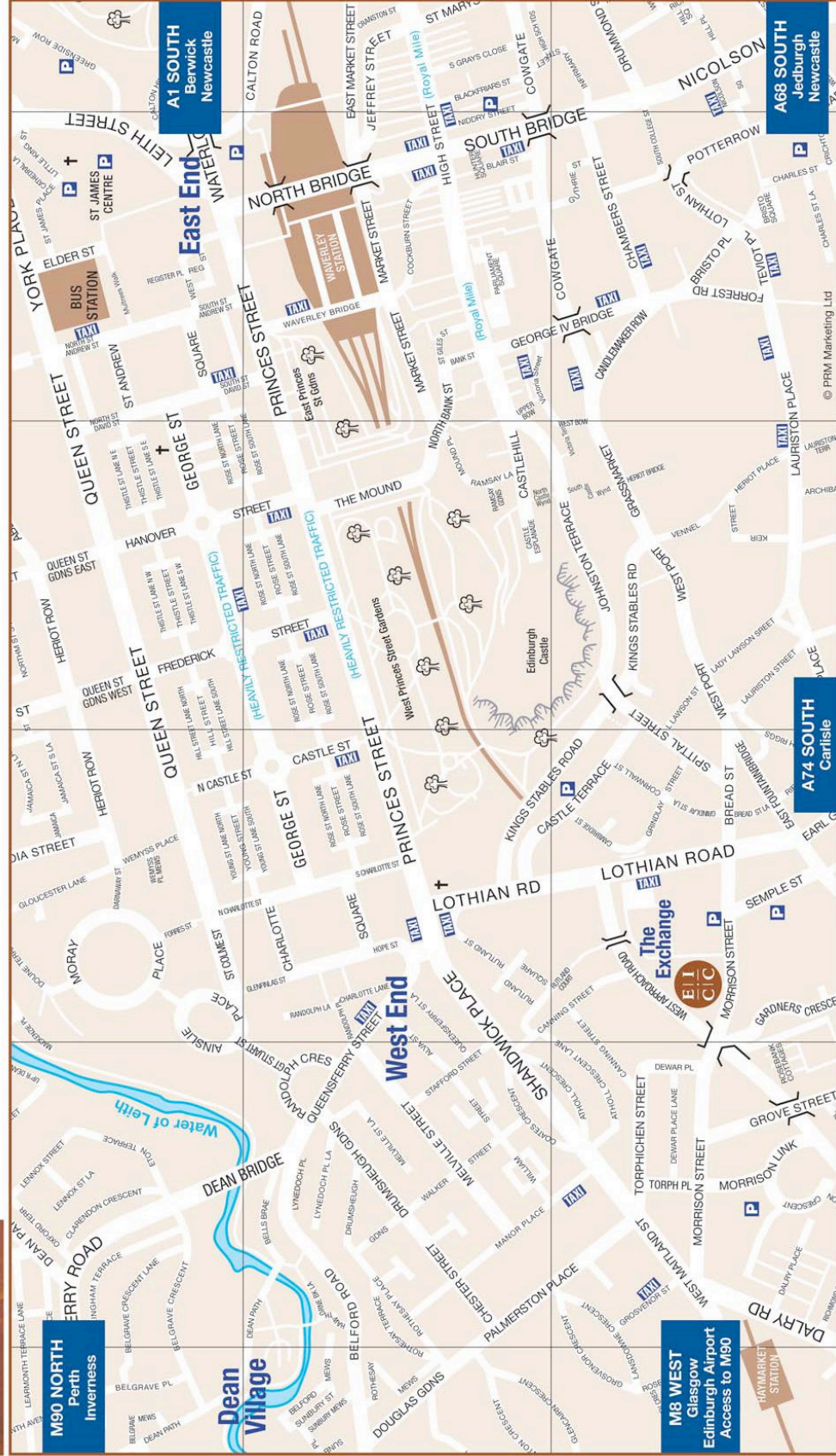
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