### Preface

We are very happy to present the proceedings of the 8<sup>th</sup> International Workshop on Interactive Distributed Multimedia Systems – IDMS 2001, in co-operation with ACM SIGCOMM and SIGMM. These proceedings contain the technical programme for IDMS 2001, held September 4–7, 2001 in Lancaster, UK.

For the technical programme this year we received 48 research papers from both academic and industrial institutions all around the world. After the review process, 15 were accepted as full papers for publication, and a further 8 as short positional papers, intended to provoke debate. The technical programme was complimented by three invited papers: "QoS for Multimedia – What's Going to Make It Pay?" by Derek McAuley, "Enabling the Internet to Provide Multimedia Services" by Markus Hofmann, and "MPEG-21 Standard: Why an Open Multimedia Framework?" by Fernando Pereira.

The organisers are very grateful for the help they received to make IDMS 2001 a successful event. In particular, we would like to thank the PC for their first class reviews of papers, particularly considering the tight reviewing deadlines this year. Also, we would like to acknowledge the support from Agilent, BTexact Technologies, Hewlett Packard, Microsoft Research, Orange, and Sony Electronics – without whom IDMS 2001 would not have been such a memorable event.

We hope that readers will find these proceedings helpful in their future research, and that IDMS will continue to be an active forum for the discussion of distributed multimedia research for years to come.

June 2001

D. Shepherd J. Finney L. Mathy N. Race

# Welcome from the Minister of State for Lifelong Learning and Higher Education

To the participants of the 8th International Workshop on Interactive Distributed Multimedia Systems:

I am delighted to welcome you all to the IDMS 2001 workshop in Lancaster, and indeed welcome many of you to the UK. We see throughout the world that conferences are being held to try to educate people in the area of distributed computing as it becomes an increasingly important part of the information society we live in. I am happy to see that the University of Lancaster are part of this drive by hosting this international conference.

I send you my best wishes for a successful workshop and hope that this opportunity to present interesting research results to a broad professional audience gives stimulus for collaboration and further progress in the field.

I wish all participants a pleasant stay in Lancaster.

Parges toage

Margaret Hodge Minister of State for Lifelong Learning and Higher Education

## Welcome to the Computing Department at Lancaster University

I'd like to extend a very warm welcome to all participants to IDMS 2001. We're particularly pleased that IDMS has come to Lancaster this year where the Distributed Multimedia Research Group has played such a prominent role in the distributed multimedia systems research community over the last 10 years.

As a rather envious outsider it has struck me how successful the distributed multimedia systems community has been in tapping the pool of research talent. In recent years at Lancaster, we have enjoyed a very strong flow of students through our Doctoral programme, from our own undergraduate programme and from elsewhere. In large measure, this has been due to the buzz generated by research in distributed multimedia systems and I'm sure this is reflected in other research and development centres.

However, we have seen this phenomenon before, where hot research areas soak up talent and resources. Thankfully, what distinguishes the distributed multimedia systems community is the coexistence of three key factors: it addresses a real economic and societal need; it has attracted the resources and backing needed to make it work; and, crucially, it is delivering. Computer Science needs challenging, high profile and successful areas like this to keep the discipline healthy.

I hope you have a great time at IDMS 2001.

Pete Sawyer Head of Computing Lancaster University

## Organisation

#### **Programme Chair**

Doug Shepherd, Lancaster University, United Kingdom

#### **Programme Committee**

Arturo Azcorra, University Carlos III, Madrid, Spain Gregor v. Bochmann, University of Ottawa, Canada Jan Bormans, IMEC, Belgium Berthold Butscher, GMD-FOKUS, Germany Andrew Campbell, Columbia University, USA Tim Chown, University of Southampton, United Kingdom Luca Delgrossi, University of Piacenza, Italy Michel Diaz, LAAS-CNRS, France Jordi Domingo-Pascual, Politechnic University of Catalonia, Spain Wolfgang Effelsberg, University of Mannheim, Germany Frank Eliassen, University of Oslo, Norway Serge Fdida, LiP6, France Joe Finney, Lancaster University, United Kingdom Vera Goebel, University of Oslo, Norway Tobias Helbig, Philips Research Laboratories, Germany David Hutchison, Lancaster University, United Kingdom Winfried Kalfa, TU Chemnitz, Germany Guy Leduc, University of Liege, Belgium Laurent Mathy, Lancaster University, United Kingdom Ketan Mayer-Patel, University of North Carolina, USA Jason Nieh, Columbia University, USA Philippe Owezarski, LAAS-CNRS, France Fernando Pereira, Instituto Superior Tecnico, Portugal Thomas Plagemann, University of Oslo, Norway Timothy Roscoe, Sprint Labs, USA Hans Scholten, University of Twente, The Netherlands Patrick Senac, ENSICA, France Marten van Sinderen, University of Twente, The Netherlands Greg O'Shea, Microsoft Research Cambridge, United Kingdom Ralf Steinmetz, TU Darmstadt/GMD, Germany Fred Stentiford, BTexact Research, United Kingdom Burkhard Stiller, ETH Zurich, Switzerland Giorgio Ventre, University Federico II, Napoli, Italy Lars Wolf, University of Karlsruhe, Germany

### **Local Organisation**

Joe Finney, Lancaster University, United Kingdom Nicholas Race, Lancaster University, United Kingdom Laurent Mathy, Lancaster University, United Kingdom Barbara Hickson, Lancaster University, United Kingdom Stefan Schmid, Lancaster University, United Kingdom Daniel Prince, Lancaster University, United Kingdom

### Supporting and Sponsoring Organisations (Alphabetically)

ACM SIGCOMM ACM SIGMM Agilent BTexact Technologies Hewlett Packard Microsoft Research Orange Sony Electronics