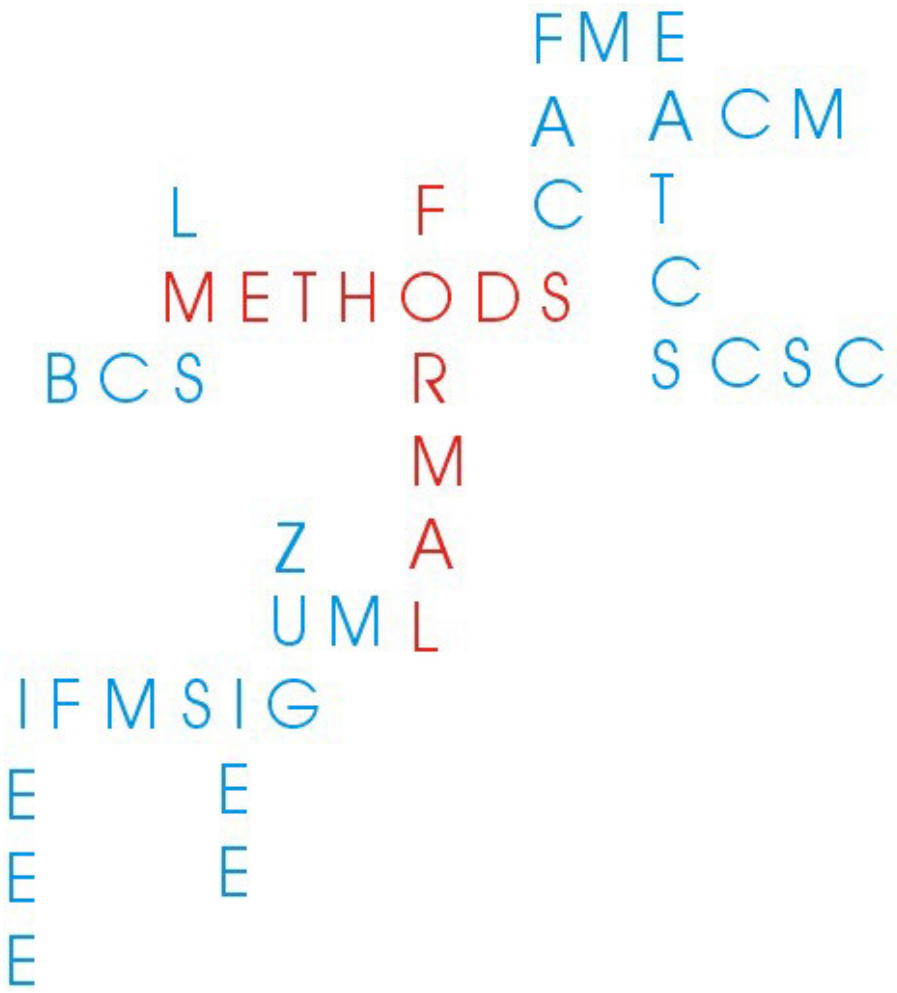
FACS FACTS

Issue 2005-3
September 2005



BCS FACS

The Newsletter of the Formal Aspects of Computing Science (FACS) Specialist Group

ISSN 0950-1231

About *FACS FACTS*

FACS FACTS [ISSN: 0950-1231] is the newsletter of the BCS Specialist Group on Formal Aspects of Computing Science (FACS). *FACS FACTS* is distributed in electronic form to all FACS members.

As from 2005, *FACS FACTS* will be published four times a year: **March**, **June**, **September** and **December**. Submissions are always welcome. Please see the advert on **page 21** for further details or visit the newsletter area of the FACS website [http://www.bcs-facs.org/newsletter].

Back issues of *FACS FACTS* are available to download from:

http://www.bcs-facs.org/newsletter/facsfactsarchive.html

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The activities of FACS (i.e. **sponsoring conferences and workshops**, **offering student bursaries** and **hosting evening seminars**) is funded solely from membership subscriptions. The more paid-up FACS members we have, the more we can do ☺

If you would like to become a FACS member – or renew your lapsed membership – please complete the membership form on **page 30** of this issue of *FACS FACTS*.

If you have any questions about FACS, please send these to the Paul Boca [Paul.Boca@virgin.net], FACS Secretary.

Suggestions on how FACS can improve are welcome too. Please do get in touch.

The Editor welcomes contributions for the new **Letters to the Editor** section of *FACS FACTS.* So get writing!

Editorial

Jonathan Bowen, BCS-FACS Chair

Welcome to another *FACS FACTS* newsletter, slightly shorter than the previous one, perhaps because of the holiday season, but we aim to keep the issues appearing as regularly as possible.

Since the last newsletter, we have unfortunately lost Mike Stannett as our Webmaster. Many thanks are due to Mike for rejuvenating the current website to a very professional standard. We hope to continue to populate it with useful and up-to-date information, but technical improvements could be slower. If there are any volunteers with web expertise who would like to take on Mike's role and develop the website further, they would be very welcome.

The FM05 conference organized by Formal Methods Europe at the University of Newcastle upon Tyne, 18–22 July 2005 [http://www.csr.ncl.ac.uk/fm05] was a successful event with many satellite workshops associated with it. Congratulations to John Fitzgerald (FACS committee member) and his team for its smooth running. There is a report in this issue on the REFT (Rigorous Engineering of Fault Tolerant Systems) Workshop and FACS sponsored the FAST (Formal Aspects of Security & Trust) and WLFM (Web Languages and Formal Methods) workshops. As a late addition, we also supported the GC6 (Grand Challenge 6) Workshop on *Dependable Systems Evolution* [http://www.fmnet.info/gc6/fm05] by contributing towards the cost of printing the proceedings, and providing some expenses for Paul Boca to attend and help with the event. The BCS sponsored the GC6 Workshop too, covering the registration fees for a number of speakers and contributing towards printing costs. We aim to provide more information on FM05 activities in a future issue. FACS also had a stand at FM05, kindly shared with Springer (see photograph above as a "proof"!).

The FACS early evening seminars at the BCS offices in Covent Garden, central London, are proving popular with an almost full house at each so far. The most recent third talk by Prof. Muffy Calder of the University of Glasgow on 21 September attracted about forty (high quality!) people. The first talk by Prof. Steve Reeves from the University of Waikato, New Zealand (perhaps the furthest formal methods outpost from London!) is reported here. We also took advantage of the attendance of Prof. Dines Bjørner of DTU, Denmark at FM05 for the second event on 25 July. Further reports will appear in future newsletters. The next evening seminar will be by Prof. Martin Henson, University of Essex, on Tuesday, 8 November 2005 (5.15pm refreshments, 5.45pm start of talk).

In 2005 we have sponsored several conferences, at a higher level than normal due to the number of international formal methods events in the UK this year. We will continue to sponsor events in 2006 (although at a slightly reduced level) and would especially welcome proposals from FACS members involved

with organizing conferences. Please send requests by email to the FACS Chair on jonathan.bowen@lsbu.ac.uk, with an outline proposal of what is required and why.

Note that the newsletter editor is a candidate in the forthcoming BCS elections. Any members or fellows of the BCS would naturally be very welcome to vote for him to bolster formal methods-friendly representation within the BCS. Details, including ballot papers, were included with the September issue of *ITNow*.

As usual, items for the FACS newsletter are welcome from any FACS member; the next deadline is 14 November 2005. Meanwhile, if you like to bring a smile to your face, please turn to the letters pages!

Fifth International Conference on Integrated Formal Methods (IFM)

30 November – 2 December
Eindhoven, The Netherlands

http://www.win.tue.nl/ifm/

Invited Speakers

Patrice Godefroid, Bell Labs (USA)
David Parnas,University of Limerick (Ireland), McMaster University (Canada)
Doron Peled, University of Warwick (UK)

Invited Tutorial

Holger Hermanns, Saarland University (Germany)

Registration

At the IFM web site, the registration page can be found. The early registration deadline is **2 October 2005**.

The registration fee includes a copy of the proceedings, attendance of the tutorial and the main conference, lunches, refreshments in the coffee breaks, a welcome reception, an excursion and dinner banquet.

Programme Committee Co-Chairs

Jaco van de Pol, CWI, The Netherlands
Judi Romijn, Eindhoven University of Technology, The Netherlands
Graeme Smith, University of Queensland, Australia

Details of Doctoral Symposium at IFM 2005 can be found on page 20

IFM2005 is sponsored by FME and BCS-FACS

The FACS Evening Seminar Series

Paul Boca, Jonathan Bowen & Jawed Siddiqi

Introduction

On 27 April 2005, the BCS-FACS Specialist Group launched a series of evening seminars *to bring together formal methods practitioners and enthusiasts, and to disseminate formal methods to a wider audience.* Professor Steve Reeves [http://www.cs.waikato.ac.nz/~stever], University of Waikato, New Zealand gave the first seminar. Attendance figures were very pleasing and they have increased with each seminar[1]. We are hoping that the series will remain popular and become a permanent fixture in FACS's event calendar.

This article by the organizers explains how the seminar series began, reports on the first seminar and provides details of future seminars.

Beginnings

In 2004, **Paul Boca** started attending early-evening seminars organized by the BCS Advanced Programming Specialist Group[2] held at the BCS Headquarters in London. He was impressed with the way in which the seminars managed to bring together a community. Boca felt that a similar seminar series dedicated to formal methods could have potential and suggested the idea to **Jonathan Bowen** and **Jawed Siddiqi** in December 2004 after the FACS Christmas meeting on the *Verified Software Repository*. Bowen and Siddiqi were both very positive about the idea and offered to help Boca organize the seminars.

The three continued discussions well into 2005, exploring various organizational factors to give the series the best chance of succeeding. An important factor was location: we wanted to keep costs as low as possible – because the seminars would be **free of charge** to attend – and at the same time make the venue easily accessible from various parts of the country. The new **BCS London Headquarters**, which is close to Covent Garden, was an obvious choice, as it satisfied both of these requirements. The BCS venue had another attractive offering: free refreshments!

The starting time of the seminars was very important too: we felt that an early evening slot would allow people, not necessarily affiliated with academic institutions, to attend after they have finished work. We decided to opt for a **5.45pm start time**. A later time was considered, but after 6pm we would either have to pay for security or arrange for someone to let in latecomers.

Frequency of the seminars was considered too: If there were too many seminars, the series would not be special and if there were too few the series may not achieve its aims. We felt that **five seminars in the first year** would be about right, since this was a new venture for FACS. Instead of holding seminars

[1] At the time of writing, we have held three seminars and preparing for the fourth.

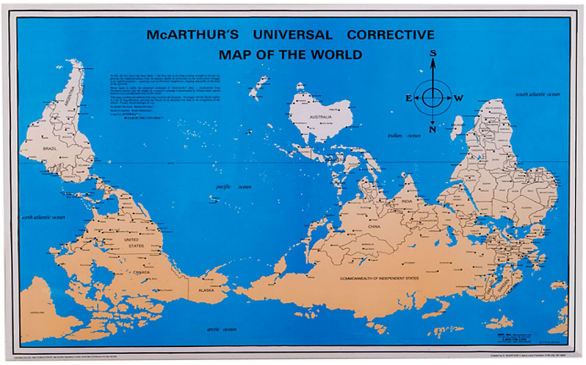
[2] The Advanced Programming Specialist Group is also known as Group 5, as it was the 5th Specialist Group of the BCS to be formed. The group has been in existence for more than 40 years!

Jonathan Bowen, BCS-FACS Chair, introduces Steve Reeves

on a regular day, as some Specialist Groups do (e.g., the Advanced Programming Specialist Group), we decided to work around the commitments of speakers. This flexibility would allow international speakers "passing through" the UK to give seminars.

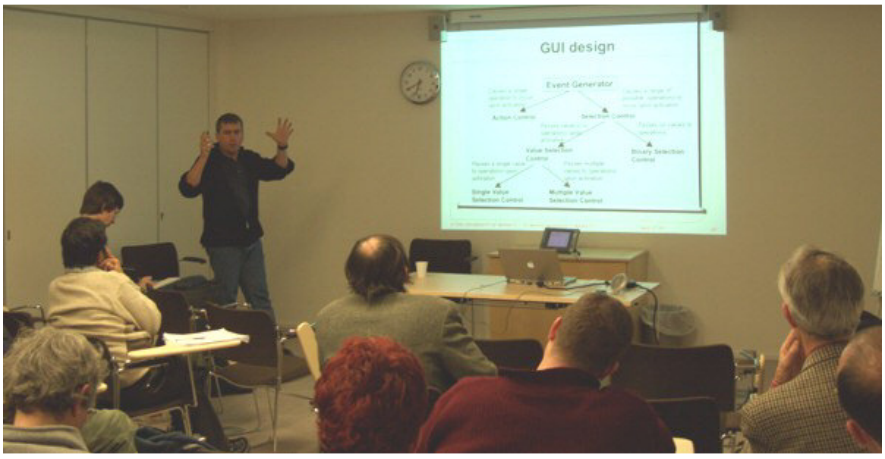
Launch

We invited Professor Steve Reeves, University of Waikato, New Zealand, to give the first seminar in the series. Reeves, who was over in the UK attending the ZB2005 [http://www.zb2005.org] conference and then visiting the University of Essex, kindly accepted. His seminar, delivered on 27 April 2005, was entitled *FM@Waikato* and was attended by more than 20 people; most were from academia, but there were some from industry present too.



The seminar began in an informal style with a whistle-stop tour of New Zealand that would have made their tourist board proud! With the aid of McArthur's Universal Corrective Map, pictured on the left, the *real* location of **New Zealand** was revealed to the audience – go and dig up your geography teachers and tell them they were wrong! After reviewing some climate data and a few noteworthy landmarks, it was time for the next stop on the tour: University of Waikato and in particular its Formal Methods laboratory.

The Formal Methods laboratory was established in 1997 after being awarded a research grant from the New Zealand government's Foundation for Research, Science and Technology. The lab currently has seven members, but it has frequent visits from colleagues overseas. For example, Professor Martin



Steve Reeves describing a formal approach to GUI design

Henson, University of Essex, a collaborator with Reeves on research into the foundational underpinnings of Z, is a regular visitor. Visits from researchers have been very fruitful and, in July 2004, "*FM in NZ*" was organized (see report in Issue 2004-3 of *FACS FACTS,* available to download from the FACS website [http://www.bcs-facs.org/newsletter/facts200411.pdf]). Please do contact Steve Reeves [stever@cs.waikato.nz] directly if you are interested in visiting.

Next, a tour of the work carried out in the laboratory. Several areas of research undertaken were described; we describe a few of these here. Z [http://www.zuser.org] features heavily in the research, and some members of the lab are involved in building tools for the specification language as part of the **Community Z Tools (CZT) project** [http://czt.sourceforge.net]. CZT focuses on building tools for editing, type checking and animating (i.e. running) specifications written in Z. Since its instigation in 2001 by Andrew Martin, University of Oxford, CZT has grown into a tool-building "industry," with developers based in UK, India, Singapore, Australia and New Zealand. The project aims to encourage interchange between Z tools and has developed an XML format (for Z) to facilitate this. Further details can be found on the SourceForge website above and in the article by Mark Utting in Issue 2004-2 of *FACS FACTS* [http://www.bcs-facs.org/newsletter/facts200407.pdf].

Ideas from HCI have been combined with those from the specification world (in particular Z) to address the problem of **Graphical Users Interface (GUI) design**. Usually formal methods are used to capture the functional aspects of GUIs, but Reeves described how they could be used to capture visual aspects too. It is possible to prove visualization properties (using a tool such as Z/EVES) early on in the development process. Work is underway on refinement and tool support for interface specifications; the eventual aim is to be able to refine a specification down to an actual interface.

Combining state-based specifications (such as Z) with process algebras is the focus of the research into **Components**. A component in this context has a public interface and private states and events. Researchers elsewhere have described ways of "gluing" together Z and CSP, for example, allowing tools to be re-used. However, that approach does not always give the best outcome. The approach taken at the FM lab is to re-visit the problem from first principles: defining a model in which states and events are on the *same* footing from the outset. In defining this new process-algebraic formalism, which is viewed from

From statecharts to streetmaps: Jonathan Bowen reveals the location of the after-seminar meal

an operational perspective, Reeves and his colleagues borrowed ideas from various other models to suit their requirements – a kind of formal Pick 'N Mix. The seminar went into some detail on which particular notions were borrowed and rejected; further details are available in the slides, which are available to download from the BCS-FACS website (see details below). Reeves used a variation on the classic vending machine example – embellished with a facility for accepting a charge card and dispensing tea if there are enough funds on the card – to show that the operation of dispensing tea could be modelled in the new formalism but not in other process algebras.

The FM group has also used Z in formalizing **mu–charts**, a simplification and reconstruction of Harel's statecharts suitable for specifying the behaviour of reactive systems. Reeves and his colleagues have shown that mu–charts can be transformed into Z, thereby giving rise to a logic (which is based on the foundational work carried out in collaboration with Henson, mentioned earlier). A logic for refining mu–charts has been developed too. Two tools are available for mu–charts: AMuZed and ZooM. AMuzed, which stands for *A Mu with Z editor*, allows charts to be created, edited, saved and printed. ZooM, which stands for *Z out of Mu-charts*, translates a chart created in AMuZed into a tex file containing the Z specification of the chart. Both tools are free to download [http://www.cs.waikato.ac.nz/Research/fm/amuzed.html].

The group researches **model checking** too. In particular, there is interest in improving the quality of reactive systems. Such systems are prevalent in society, occurring in home appliances (e.g. televisions), cars (e.g. central locking system) and in industrial plants (e.g. oil refinery). They are hard to design and implement, and some failures can have catastrophic consequences. The group is developing a tool that allows editing of finite-state models of systems and checking whether they have particular properties. New methods are being developed by researchers in the lab to allow this checking to be performed in a "smart way."

Further information can be found in the presentation slides, which are available to download from the BCS-FACS seminars webpage [http://www.bcs-facs.org/events/EveningSeminars/steve_reeves_27_05.html].

Attendees before the seminar discussing the finer points of Z

Future

Professor Dines Bjørner, Technical University of Denmark, gave the second seminar in the series on 25 July 2005. The seminar, which was attended by nearly 40 people – an excellent turn out for a formal methods seminar – focussed on *Domain Engineering*, drawing on examples from the Train Domain, a Grand Challenge in Computer Science; we will report on this in the next issue of *FACS FACTS*. In the meantime, you may download the slides from the BCS-FACS website [http://www.bcs-facs.org/events/EveningSeminars].

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We organized the third seminar, which was given by **Professor Muffy Calder**, University of Glasgow, and entitled *Formal Methods Meets Biochemical Pathways*, jointly with another BCS Specialist Group: BCSWomen [http://www.bcs.org.uk/bcswomen]. Once again, attendance figures were excellent (37 people). Professor Calder's slides are available to download from the BCS-FACS website too.

Two more seminars are planned for this year. **Professor Martin Henson**, University of Essex, will give the fourth seminar in the series on 8 November. The final seminar will be by **Professor Jack Copeland**, University of Canterbury, New Zealand, on 8 December. Further details will be available on the FACS website [http://www.bcs-facs.org/events/EveningSeminars] in due course.

We have already started planning the seminar series for 2006. We hope to organize some of these seminars jointly with **BCSWomen** and **Formal Methods Europe** [http://www.fmeurope.org].

REFT 2005 Workshop Report

Joey Coleman

The 2005 workshop on Rigorous Engineering of Fault Tolerant Systems [http://www.csr.ncl.ac.uk/fm05/main_workshops.php?mode=info&language=english&workshop=10] (REFT) was held on 19 July 2005 in conjunction with the Formal Methods 2005 conference [http://www.csr.ncl.ac.uk/fm05] at the University of Newcastle upon Tyne, England.

Organized by the RODIN (Rigorous Open Development Environment for Complex Systems) [http://rodin.cs.ncl.ac.uk] project, this workshop brought together researchers who are interested in the application of rigorous design techniques to the development of fault tolerant software based systems. RODIN is the 3-year EU IST STREP project, running from September 2004 until 2007. The overall objective of the project is to develop a formal methodology and a supporting open and extensible tool platform for cost effective and rigorous development of dependable, fault-tolerant, complex software systems. More information about RODIN, including project deliverables and publications, can be found on the above website.

Attendance at the workshop was excellent with 32 delegates registered beforehand, and the workshop room had about 40 attendees on the day. The talks ranged broadly across themes including methodological, architectural, requirements, tools, and languages. Specific topics addressed during the workshop included the use of Event-B, requirements engineering, and generating specifications from the problem domain.

A brief description of the three invited talks follows to give a sense of the workshop. All of the presentations given during the day were interesting and well worth attending.

Ian Hayes gave the first invited talk, focusing on research that is being done in collaboration with Cliff Jones and Michael Jackson. The talk focused on control systems and what is needed to create accurate specifications of their behaviour. These needs directly involve the model of domain in which the control system will be placed.

The domain model is used to identify the assumptions under which the control system must run. These assumptions are usually highly implicit, and often hard to identify. It is, nonetheless, important to identify and record them. The domain model itself must be carefully considered to determine the correct boundary. If the scope of the domain is too small then the system becomes narrow and fragile; if it is too large then the system becomes unfeasible.

The domain model also helps in identifying the various erroneous and hazardous behaviours that are present in the system, which allows the specification of the correct responses to those behaviours. The question of how to present an error-tolerating specification without losing clarity is still unresolved.

José-Luis Fernández-Villacañas Martín gave the second invited talk, presenting an overview of the mission of the Software Technologies Unit in the Information Society and Media Directorate of the European Commission. In addition to giving the general overview of what the unit does, and the context it

works within, he also presented some specific detail regarding Call 5 of the Sixth Framework Programme as well as the upcoming Seventh Framework Programme.

In the third invited talk, **Shmuel Katz** began by giving us a quick overview of AOSD (Aspect-Oriented Software Development). The basis for AOSD is that pure object-oriented development does not work because many of the concerns (requirements, say) cut across many classes and methods. The basic notion of aspects, then, is that a given concern is coded as an aspect, then "woven" into the rest of the system. This allows for a central decomposition with all of the aspects separated out.

Aspects were discussed as a means to add fault tolerance onto an intolerant system, through a pair of small examples. The issues of aspects with respect to formal methods were also discussed, especially with regard to verification and the interaction between separate aspects and the original system.

This presentation was given within the context of the European Network of Excellence on Aspect-Oriented Software Development [http://www.aosd-europe.net] (AOSD-Europe), which also falls within the same unit in the IST. AOSD-Europe is working to harmonize and integrate the research activities being done on AOSD in Europe.

The proceedings of the workshop have been published as a Technical Report from the School of Computing Science at the University of Newcastle upon Tyne. The series number is CS-TR-915, and is available on the web [Number 11 at http://rodin.cs.ncl.ac.uk/publications.htm].

List of Workshop Papers

- *Using domain models to specify systems*
  Ian Hayes
- *Formal Service-Oriented Development of Fault Tolerant Communicating Systems*
  Linas Laibinis, Elena Troubitsyna, Sari Leppanen, Johan Lilius, Qaiser Malik
- *Towards a methodology for rigorous development of generic requirements patterns*
  Colin Snook, Michael Poppleton, Ian Johnson
- *Analyzing Fault-Tolerant Systems with FAUST*
  C. Ponsard, P. Massonet, J.F. Molderez
- *Rigorous Fault Tolerance Using Aspects and Formal Methods*
  Shmuel Katz
- *The Fault-Tolerant Insulin Pump Therapy*
  Alfredo Capozucca, Nicolas Guelfi, Patrizio Pelliccione
- *Omnibus: A clean language and supporting tool for integrating different assertion-based verification techniques*
  Thomas Wilson, Savi Maharaj, Robert Clark

- *Towards Formal Development of Mobile Location-based Systems*
  Alexei Iliasov, Linas Laibinis, Alexander Romanovsky, Elena Troubitsyna
- *Examples of how to Determine the Specifications of Control Systems*
  Joey Coleman, Cliff Jones
- *FMEA-technique of Web Services Analysis and Dependability Ensuring*
  Anatoliy Gorbenko, Vyacheslav Kharchenko, Olga Tarasyuk
- *Modelling Fault Tolerance of Transient Faults*
  Dubravka Ilic, Elena Troubitsyna
- *Application of Event B to Global Causal Ordering for Fault Tolerant Transactions*
  Divakar Yadav, Michael Butler
- *Are Practitioners Writing Contracts?*
  Patrice Chalin
- *Modeling and Analysis of Architectural Exceptions*
  Fernando Castor Filho, Patrick Henrique da S. Brito, Cecilia Mary F. Rubria
- *Examining BPEL's Compensation Construct*
  Joey Coleman
- *On Specification and Verification of Location-based Fault Tolerant Mobile Systems*
  Alexei Iliasov, Victor Khomenko, Maciej Koutny, Alexander Romanovsky
- *Shortest Violation Traces in Model Checking Based on Petri Net Unfoldings and SAT*
  Victor Khomenko

Getting in touch

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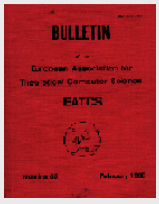
Newsletters from other organisations

CoLogNET

http://www2.cs.ucy.ac.cy/projects/colognet

EASST

http://www.easst.org/newsletter



http://www.liacs.nl/~beatcs

http://www.lms.ac.uk/newsletter/newsletter.html

Train Column

Dines Bjørner

1 The TRain Workshop @ FM'05, Newcastle, UK

An all day TRain workshop was held at FM'05, Newcastle, UK, Tuesday 19 July, 2005. Attendance was fair: some 14 people most of the day. A number of presentations were given:

- Dines Bjørner: A Domain Model of Net Topology
- Martin Penicka: Varieties of Railway Systems Models
- Anders Moen Hagisletto: Petri Net Models of Rails
- Sanjeev Kumar Appicharla: UK Railnet Concerns

The workshop ended with a discussion amongst all participants as to where TRain could go from now on. The discussion focused on a possible research agenda. A report on this might be expected from Dines Bjørner and Jim Woodcock in due course.

2 The TRain Workshop @ SEFM 2005, Koblenz, Germany

A one and one-half day TRain workshop was held at SEFM 2005, Koblenz, 5–6 September, 2005. As the current TRain column is being written before the event actually took place we shall bring you a report on the event later. Meanwhile, here is a list of the papers to be presented:

- *A Domain Model of Railway Nets*
  Dines Bjørner, Kgs. Lyngby, Denmark
- *Formal Safety Analysis of Transport Control Systems*
  Frank Ortmeier and Wolfgang Reif, Augsburg, Germany Short Paper
- *Verification and Generation of Geographical Data Using Domain Theory*
  (Extended Abstract)
  Lars-Henrik Ericsson, Uppsala, Sweden
- *Domain-Specific Description, Model-Based Development and Verification for Railway Control Systems*
  Jan Peleska, Bremen, Germany
- *Variety of Domain Models of Railway System Functions*
  Martin Penicka, Prague, Czech Republic
- *Some Experiences on Formal Specification of Railway Interlocking Systems Using Statecharts*
  Michele Banci, Alessandro Fantechi and Stefania Gnesi, Florence and Pisa, Italy

- *Validation of the B-developed SAET-METEOR (14 lines of Paris Metro) - and other TRain-related information*
  Jean-Louis Boulanger, France
- *Challenges in Simulating Railway Systems Using Petri Nets*
  Joakim Bjørk, Anders Moen Hagalisletto and Pål Enger, Oslo, Norway
- *Bounded Model Checking of Train Control Systems*
  Sebastian Kinder, Daniel Grosse, Jan Peleska and Rolf Drechsler, Bremen, Germany

The agenda is also available online [http://www.imm.dtu.dk/~db/train].

3 Membership

There are now 122 members of the TRain effort from 38 countries.

4 Further Information

For the latest information about the Train effort, please consult the website http://www.railwaydomain.org

Getting in touch

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Formal Methods Community Project

Wanted! Back issues of *FACS FACTS* or *FACS Europe*

The FACS group would like to archive *all* of its newsletters and make them available on the FACS website for downloading and viewing. If you can help, please email us on info@bcs-facs.org.uk. Help with scanning would be appreciated.

http://www.bcs-facs.org/newsletter/facsfactsarchive.html

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**** New website ****

http://www.csp-b.org

CSP||B combines two established methods to support software specification and development. The website aims to host papers related to the approach, other resource material and information about projects using the approach. Contributions to the website are welcome and may be sent to Helen Treharne [H.Treharne@surrey.ac.uk]

CSK Corporation Launches VDMTools in Japan

Araki Keijiro, Dines Bjørner & Peter Gorm Larsen

CSK Corporation is a large Japanese software house. In 2004, CSK acquired the IPR for VDMTools from IFAD A/S (Odense, Denmark). On 3–4 August 2005, CSK launched the free use of VDMTools in Japan at two VDM Symposia in Osaka and Tokyo. These simultaneous Japanese/English translation symposia were attended by approximately 50, respectively 120 CSK customers. The symposia were half day afternoon events (1:30–5:30 pm) which featured 50 minute talks by the three authors of this news item as well as by Shuichi Sekiya and Taro Kurita of Felica Networks, a subsidiary of Sony Corp., NTT DoCoMo Inc. and East Japan Railway Company.

The symposia were opened by CSK director Teiichi Aruga [3] who motivated the use of formal techniques in future software developments, especially of embedded systems in Japan.

The talks overviewed different issues in connection with the industrial uptake on formal techniques. Bjørner's talk overviewed a number of formal development issues – from domains via requirements to software design. Larsen reviewed a number of industrial uses of the IFAD VDMTools now owned by CSK Corporation. Shuichi and Taro reviewed the use of VDM and VDMTools in the industrial scale development of security-critical software for a new generation of smart cards. Araki put the above and many additional formal software development issues, including sociological issues, in a larger context.

We report on this industrial event, as we believe it to be of significant news value to the readers of *FACS FACTS*. One of the largest Japanese software houses, itself with a history of several successful VDM-based developments, has purchased the leading toolset of an important formal methods approach, and is creating a VDM consortium of users of that toolset, based on public domain software.

The CSK VDM Symposium was organised by Masahiko Suzuki (CSK) and Shin Sahara (CSK) – the latter known to many *FACS FACTS* readers and FME Symposia goers. For more information on VDM you may browse the website http://www.csk.co.jp/support_e/vdm.

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[3] CSK, with Mr. Teiichi Aruga, is a member of ForTIA [http://www.fortia.org], the Formal Techniques Industry Association founded at FM'03, Pisa, and featured now at Industry Days at FM'02, FM'03 and, most recently at FM'05.

SEEFM'05

2nd South-East European Workshop on Formal Methods

Practical dimensions: Challenges in the business world

18–19 November 2005

Ohrid, Former Yugoslav Republic of Macedonia

http://www.seefm.info/seefm05

The successful organisation of the 1st South-East European Workshop in Formal Methods that took place in Thessaloniki on 20 November 2003, fulfilled its goal by bringing people from South-Eastern Europe together, based on their common interests in Formal Methods. The aim of the 2nd workshop is to bring together more researchers from South-Eastern European countries and not only those interested in Formal Methods. More specifically, the workshop intends to establish a network of scientists in the wider Balkan area who are active in the field of Formal Methods. The theme of this workshop deals with the practical dimensions of formal methods, that is how formal methods can deal with the challenges in the business world, in order to facilitate practical development of dynamically evolving, correct and safe software systems.

Invited Speakers

Professor Jonathan Bowen, London South Bank University

Professor John Derrick, University of Sheffield

The workshop is sponsored by BCS-FACS

RefineNet: Report on Final Meeting

John Derrick

A meeting of the EPSRC funded RefineNet network [http://www.refinenet.org.uk] took place in Manchester on 5–6 July 2005. The general theme was automation, and included talks by/on:

- *Model checking Circus*
  Leo Freitas
- *Unifying Theories in ProofPower-Z*
  Marcel Oliveira
- *On the Automatic Verification of Non-Standard Measures of Consistency*
  Christie Bolton
- *Simulation and Refinement in a Coalgebraic Setting*
  Corina Cirstea

The talks were well received and generated a lively discussion. Thanks to Richard Banach for the organization.

Getting in touch

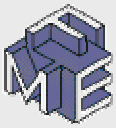
John Derrick
Sheffield University

John.Derrick@dcs.shef.ac.uk

The next RefineNet meeting will take the form of a one-day workshop at the ICFEM [http://www.cs.man.ac.uk/icfem05] conference on **31 October 2005**, also in Manchester. The workshop is open to all, whether attending ICFEM or not, and a call for contributions and participation will be issued nearer the time.

Joining Other Societies and Groups

London Mathematical Society
http://www.lms.ac.uk/contact/membership.html



Formal Methods Europe
http://www.fmeurope.org/fme/member.htm

European Association for Theoretical Computer Science
http://www.eatcs.org/organization/membership.html#how_to_join

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PhD Abstracts

Name	Jonathan Burton
Thesis Title	The Theory and Practice of Refinement-After-Hiding
Supervisor	Professor Maciej Koutny
Institute	University of Newcastle upon Tyne
Examiners	Dr. Howard Bowman & Professor Cliff Jones
Awarded	June 2004
URL	http://www.cs.ncl.ac.uk/research/pubs/trs/papers/904.pdf
Keywords	process algebra, CSP, behaviour abstraction, verification, asynchronous communication

Abstract

In software or hardware development, we take an abstract view of a process or system – i.e. a specification – and proceed to render it in a more implementable form. The relationship between an implementation and its specification is characterised in the context of formal verification using a notion called refinement: this notion provides a correctness condition which must be met before we can say that a particular implementation is correct with respect to a particular specification. For a notion of refinement to be useful, it should reflect the ways in which we might want to make concrete our abstract specification. In process algebras, the notion that a process Q implements or refines a process P is based on the idea that Q is more deterministic than P: this means that every behaviour of the implementation must be possible for the specification. Consider the case that we build a (specification) network from a set of (specification) component processes, where communications or interactions between these processes are hidden. The abstract behaviour which constitutes these communications or interactions may be implemented using a particular protocol, replication of communication channels to mask possible faults or perhaps even parallel access to data structures to increase performance. These concrete behaviours will be hidden in the construction of the final implementation network and so the correctness of the final network may be considered using standard notions of refinement. However, we cannot directly verify the correctness of component processes in the general case, precisely because we may have done more than simply increase determinism in the move from specification to implementation component. Standard (process algebraic) refinement does not, therefore, fully reflect the ways in which we may wish to move from the abstract to the concrete at the level of such components. This has implications both in terms of the state explosion problem and also in terms of verifying in isolation the correctness of a component which may be used in a number of different contexts. We therefore introduce a more powerful notion of refinement, which we shall call refinement-after-hiding: this gives us the power to approach verification compositionally even though the behaviours

of an implementation component may not be contained in those of the corresponding specification, provided that the (parts of the) behaviours which are different will be hidden in the construction of the final network. We explore both the theory and practice of this new notion and also present a means for its automatic verification. Finally, we use the notion of refinement-after-hiding, along with the means of verification, to verify the correctness of an important algorithm for asynchronous communication. The nature of the verification and the results achieved are completely new and quite significant.

Doctoral Symposium at IFM 2005

PhD students are kindly invited to submit a contribution on their current research in integrated formal methods to the Doctoral Symposium of the 5th International Conference on Integrated Formal Methods (IFM).

See http://www.win.tue.nl/ifm/ for the conference topics.

The doctoral symposium will take place in Eindhoven on **29 November**, right after the tutorial by Holger Hermanns, and one day before the main conference (**30 November – 2 December**), with invited talks by Patrice Godefroid, David Parnas and Doron Peled.

What do we require?

Send a 5 page extended abstract in PS or PDF format to ifm@win.tue.nl.
This abstract should:

- contain your name, affiliation, and a 200 word abstract
- clearly identify the research question you are addressing
- present preliminary ideas for the proposed approach and the contributions and results so far
- contain a comparison with related work

Please also include a letter of recommendation by your advisor, stating your research topic and expected date of your dissertation, which should be later than the symposium.

Time schedule

17 October 2005: submission of 5 pages (postscript/pdf) to ifm@win.tue.nl
21 October 2005: notification of selected contributions
29 November 2005: doctoral symposium
2 December 2005: afterthought and best student paper award.

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FACS FACTS Issue 2005-4

Call for Submissions

Deadline **14 November 2005**

We welcome contributions for the next issue of *FACS FACTS*, in particular:

- Letters to the Editor
- Conference reports
- Reports on funded projects and initiatives
- Calls for papers
- Workshop announcements
- Seminar announcements
- Formal methods websites of interest
- Abstracts of PhD theses in the formal methods area
- Formal methods anecdotes
- Formal methods activities around the world
- Formal methods success stories
- News from formal methods-related organizations
- Experiences of using formal methods tools
- Novel applications of formal methods
- Technical articles
- Tutorials
- Book announcements
- Book reviews
- Adverts for upcoming conferences
- Job adverts
- Puzzles and light-hearted items

Please send your submissions (in Microsoft Word, LaTeX or plain text) to Paul Boca [editor@facsfacts.info], the Newsletter Editor, by **14 November 2005**.

If you would like to be an official *FACS FACTS* reporter or a guest columnist, please contact the Editor.

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Conference Announcements

The following are sponsored by BCS-FACS and/or considered of special interest to BCS-FACS members:

October 2005

FORTE 2005 – 25th IFIP WG 6.1 International Conference on Formal Techniques for Networked and Distributed Systems
2–5 October
Taipei, Taiwan
http://cc.ee.ntu.edu.tw/~forte05

ICTAC 2005 – International Colloquium on Theoretical Aspects of Computing
17–21 October
Hanoi, Vietnam
http://www.iist.unu.edu/ictac05

NWPT 05 – 17th Nordic Workshop on Programming Theory
19–21 October
Copenhagen, Denmark
http://www.diku.dk/NWPT05

November 2005

FMCO 2005 – 4th International Symposium on Formal Methods for Objects and Components
1–4 November
Amsterdam
http://fmco.liacs.nl/fmco05.html

ICFEM 2005 – 7th International Conference on Formal Engineering Methods
1–4 November
Manchester, UK
http://www.cs.man.ac.uk/icfem05

SEEFM 2005 – 2nd South-East European Workshop on Formal Methods 2005
18–19 November
Ohrid, Former Yugoslav Republic of Macedonia
http://www.seefm.info/seefm05

IFM 2005 – 5th International Conference on Integrated Formal Methods
29 November – 2 December
Eindhoven, The Netherlands
http://www.win.tue.nl/ifm

December 2005

FACS Christmas Meeting: FORTEST workshop on Formal Methods and Testing
19 December
BCS London Office
http://www.bcs-facs.org/events/xmas2005

January 2006

POPL 2006 – 33rd Annual Symposium on Principles of Programming Languages
11–13 January
Charleston, USA
http://www.cs.princeton.edu/~dpw/popl/06

February 2006

UITP 06 – 1st International Symposium on Unifying Theories of Programming
5–7 February
Walworth Castle, County Durham
www.scm.tees.ac.uk/utpsymposium

March 2006

ETAPS 2006: European Conference on Theory And Practice Of Software
25 March – 2 April
Submission: 7 October
Vienna, Austria
http://www.complang.tuwien.ac.at/etaps06

TACAS 2005 – Tools and Algorithms for the Construction and Analysis of Systems
25 March – 2 April
Submission: 7 October
Vienna, Austria
http://depend.cs.uni-sb.de/index.php?id=329

MBT 2006 – 2nd Workshop on Model Based Testing
25–26 March
Submission: 25 November
Vienna, Austria
http://react.cs.uni-sb.de/mbt2006

March 2006

FASSE 2006 – Fundamental Approaches to Software Engineering
27–29 March
Submission: 7 October
Vienna, Austria
http://www.elet.polimi.it/conferences/fase06/

FOSSACS – Foundations of Software Science and Computation Structures
27–31 March
Submission: 7 October
Vienna, Austria
http://fossacs06.ru.is

SPIN 2006 – 13th International SPIN Workshop on Model Checking of Software
30 March – 1 April
Submission: 2 December
Vienna, Austria
http://www.cs.tut.fi/SPIN2006

April 2006

BCTCS 2006 – 22nd British Colloquium for Theoretical Computer Science
4–7 April
Submission: check event website
Swansea, UK
http://www.cs.swan.ac.uk/BCTCS2006

SEW-30 – 30th Annual NASA/IEEE Software Engineering Workshop, part of 2nd Systems and Software Week
24–28 April
Submission: check event website
Columbia, Maryland, USA
http://www.systemsandsoftwareweek.org

August 2006

FM2006 – Formal Methods 2006
21–27 August
Submission: 24 February
Ontario, Canada
http://fm06.mcmaster.ca

For further conference announcements, please visit the **Formal Methods Europe** website [http://www.fmeurope.org], the **EATCS** website [http://www.eatcs.org] and the **Virtual Library Formal Methods** website [http://vl.fmnet.info/meetings].

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Book Announcements

The art, craft, discipline, logic, practice and science of developing large-scale software products needs a professional base. The textbooks in this three-volume set combine informal, sound engineering sound approaches with the rigor of formal, mathematics-based approaches.

This volume covers the basic principles and techniques of abstraction and modelling. First, it provides a sound, simple basis of insight into discrete mathematics: numbers, sets, Cartesians, types, functions, the Lambda calculus, algebras and mathematical logic. Then it teaches its readers basic property- and model-oriented specification principles and techniques. The model-oriented concepts that are common to such specification languages as B, VDM-SL and Z are propagated here using the RAISE specification language (RSL). Finally, the book covers the basic principles of functional, imperative and parallel specification programming.

Software Engineering 1
Abstraction and Modelling
Texts in Theoretical Computer Science. An EATCS Series
Dines Bjørner
2005, Approx. 600 p., Hardcover
ISBN: 3-540-21149-7

This volume covers the basic principles and techniques of specifying systems and languages. It deals with modelling the semiotics (pragmatics, semantics and syntax of systems and languages), modelling spatial and simple temporal phenomena, and such specialized topics as modularity (incl. UML class diagrams), Petri nets, live sequence charts, statecharts, and temporal logics, including the duration calculus. Finally, the book presents techniques for interpreter and compiler development of functional, imperative, modular and parallel programming languages.

This book is targeted at late undergraduate to early graduate university students, and researchers of

programming methodologies. Vol. 1 of this series is a prerequisite text.

Software Engineering 2
Specification of Systems and Languages
Texts in Theoretical Computer Science. An EATCS Series
Dines Bjørner
2005, Approx. 600 p., Hardcover
ISBN: 3-540-21150-0

Advocating a novel approach based on understanding the application domain before formulating the requirements, the book takes the reader from the principles and techniques for the development of domain descriptions – via principles and techniques for the derivation of requirements prescriptions from domain models – to principles and techniques for the refinement of requirements into software designs: architectures and component design.

Focusing only on the informal parts, this book targets undergraduate students in courses on software engineering and college lecturers in that field, while the full version of the book also targets advanced students, lecturers and researchers.

Software Engineering 3
Domains, Requirements, and Software Design
Texts in Theoretical Computer Science. An EATCS Series
Dines Bjørner
2005, Approx. 700 p., Hardcover
ISBN: 3-540-21151-9

All three volumes written for

Lecturers, Graduates, Libraries

Keywords

Domain Engineering, Formal Methods, Requirements Engineering, Software Architecture, Software Engineering

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14th International Symposium on Formal Methods

21 - 27 August 2006

McMaster University, Hamilton, Ontario, Canada

http://fm06.mcmaster.ca

ORGANIZATION

General Chair
Emil Sekerinski (McMaster)

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Axel van Lamsweerde (U. Louvain)
Martin Wirsing (LMU Munich)
Pierre Wolper (U. Liege)

FM'06 is the fourteenth in a series of symposia organized by Formal Methods Europe, http://www.fmeurope.org, an independent association whose aim is to stimulate the use of, and research on, formal methods for software development. The symposia have been notably successful in bringing together innovators and practitioners in precise mathematical methods for software development, industrial users as well as researchers. Submissions are welcomed in the form of original papers on research and industrial experience, proposals for workshops and tutorials, entries for the exhibition of software tools and projects, and reports on ongoing doctoral work.

FM'06 welcomes all aspects of formal methods research, both theoretical and practical. We are particularly interested in the experience of applying formal methods in practice. The broad topics of interest of this conference are:

* Tools for formal methods: tool support and software engineering, environments for formal methods.
* Theoretical foundations: specification and modelling, refinement, static analysis, model-checking, verification, calculation, reusable domain theories.
* Formal methods in practice: experience with introducing formal methods in industry, case studies.
* Role of formal methods: formal methods in hardware and system design, method integration, development process.

Technical Symposium: Full papers should be submitted via the web site. Papers will be evaluated by the Program Committee according to their originality, significance, soundness, quality of presentation and relevance with respect to the main issues of the symposium. Accepted papers will be published in the Symposium Proceedings, to appear in Springer's Lecture Notes in Computer Science series, http://www.springeronline.com/lncs. Submitted papers should have not been submitted elsewhere for publication, should be in Springer's format, (see Springer's web site), and should not exceed 16 pages including appendices. A prize for the best technical paper will be awarded at the symposium.

Industry Day: One day will be dedicated to sharing the experience–both positive and negative–with using formal methods in industrial environments. The Industry Day is organized by ForTIA, the Formal Techniques Industry Association, http://www.fortia.org. This year's Industry Day investigates the use of formal methods in security and trust. Invited papers on organizational and technical issues will be presented. Inquiries should be directed to the Industry Day Chairs; see the web site for details.

Workshops: We welcome proposals for one-day or one-and-a-half-day workshops related to FM'06. In particular, but not exclusively, we encourage proposals for workshops on various application domains. Proposals should be directed to the Workshop Chair.

Tutorials: We are soliciting proposals for full-day or half-day tutorials. The tutorial contents can be selected from a wide range of topics that reflect the conference themes and provide clear utility to practitioners. Each proposal will be evaluated on importance, relevance, timeliness, audience appeal and past experience and qualification of the instructors. Proposals should be directed to the Tutorial Chair.

Poster and Tool Exhibition: An exhibition of both research projects and commercial tools will accompany the technical symposium, with the opportunity of holding scheduled presentations of commercial tools. Proposals should be directed to the Poster and Tools Exhibition Chair.

Doctoral Symposium: For the first time, FM'06 will feature a doctoral symposium. Students are invited to submit work in progress and to defend it in front of "friendly examiners". Participation for students who are accepted will be subsidized. Submissions should be directed to the Doctoral Symposium Chair.

Submission Dates:

Technical Papers, Workshops, Tutorials	**Friday, February 24, 2006**
Posters and Tools, Doctoral Symposium	**Friday, May 26, 2006**

Notification Dates:

Technical Papers	**Friday, April 28, 2006**
Workshops, Tutorials	**Friday, March 10, 2006**
Posters and Tools, Doctoral Symposium	**Friday, June 9, 2006**

Sponsors:

Letters to the Editor

The Editor reserves the right to edit submissions

Dear Editor,

We, the undersigned, are writing to categorically condemn the "article", which appeared in the latest edition of your newsletter under the authorship of one "F. X. Reid".

It is an open secret that "F. X. Reid" is in fact the *nom de guerre* of a cabal of disaffected, third-rate academics, whose repeated, and indeed deserved, failure to publish the results of their so-called research in reputed journals such as ours has (for want of a better word) *inspired* them to concoct scurrilous "satires" in which they seek to ridicule their (deservedly) more successful colleagues (using the term in a somewhat loose sense).

Naturally, we would normally treat this piece of impertinence with the contempt it deserves. However, the "article" has evoked some hostility among our more junior colleagues, and we must deal, albeit reluctantly, with this problem at source.

Their principal complaint seems to be (we write "seems" because these people are, for the most part, woefully inarticulate), that we are a freemasonry, which contrives to allow publication of no work other than our own.

Even were this to be the case (a suggestion that we firmly reject), has it not occurred to these persons that it is our duty to publish *only the best work*, and that, inevitably, the best work is produced by people such as ourselves? It is surely political correctness gone mad to insist that we should publish anything, no matter how worthless, merely out of some misguided sense of charity.

The puerile subterfuges listed in "Reid"'s "article" represent a transparently paranoid response to perfectly rational and professional practices. After all, when faced with twenty pages of impenetrable algebra, having no perceptible relation with mainstream work, such as our own, who in his right mind would not demand clarification, particularly if the author or authors had egregiously neglected to use a spell-checker?

Let there be no more of this peevish bile. You do yourselves and your newsletter no service by printing it.

Yours apoplectically,

Professor R. von Ananias
Professor G.B.H. Pecksniff
Professor M. de Crème de Menthe

Offices of Hypothetical Computer Science.

Dear Editor,

Me and the lads just want to say a big thank-you to Prof. Reid for his piece in your mag! I must say it bucked us up a treat to see those toffee-nosed so-and-sos get what was coming to them!

Our poor Myrtle was in floods when her thing on psuedo-Coddian normalisation got sent back 'cos it didn't have no Category Theory in it, and the Prof hit the cooking sherry real hard when the sons of bachelors told him off 'cos his stuff on hyper-graph traversal algorithms "failed to address the issue of the Brock-Ackermann anomaly", whoever he is when he's at home. I mean, don't they actually *read* the stuff we send them?

So we say, keep up the good work, mate, and show up those bourgeois elitists for the revisionist fascist scum they are!

Dr. Bruce Force-Approach

Department of Computing,
Kier Hardy Institute of Technology,
Bolton

● ● ● ● ● ● ● ● ● ● ●

Dear Editor,

I have been inundated by e-mails in consequence of sending my little piece to *FACS FACTS*. I fully regret having done so.

Leaving aside the numerous communications from individuals of dubious standing offering me large sums of money in used notes in exchange for my bank details,[4] my recent electronic correspondence has consisted almost entirely of violent abuse of the said article. Indeed, I have now received more death threats than Anne Robinson.

I would therefore like to take this opportunity to insist that as a Scientist, it is my duty to observe, assess and report any phenomena that I believe of interest to my friends, followers and disciples, and in that respect I have behaved with nothing more than cool impartiality.

May I add, emphatically, that I have absolutely no ambition to act as an "agony aunt" (whatever that may be) for desperate academics driven to desperation by failure and neglect. My work on Temporal Algebraic Relativistic Dynamical Information Systems is occupying too much of my time (not to mention its relative dimension in space) to waste on such frivolity.

And for the last time, I have not agreed to reprise my role as Dr. Who. "As I child, I acted as a child. Now that I have become a man I have given up acting".

I remain yours sincerely,

Professor Dr. F. X. Reid
Institute for Frighteningly Advanced Studies, Gallifrey

[4] They stubbornly persist in so doing, despite my having successfully extracted several million Euros from them!

FACS membership application/renewal (2005)

Title (Prof/Dr/Mr/Ms) _____ **First name** _____ **Last name**_____

Email address (required for options * below)_____

BCS membership No. (or sister society name + membership number)

_____

Address _____

_____

_____

Postcode _____ **Country** _____

I would like to take out **membership to FACS** at the following rate:

- ❑ £15 (Previous member of BCS-FACS now retired, unwaged or a student)
- ❑ £15 (Member of BCS or sister society with web/email access)*
- ❑ £30 (Non-member or member of BCS or sister society without web/email access)

In addition I would like to subscribe to **Volume 17 of the FAC journal** at the following rate:

- ❑ £46

For electronic only journal subscription*, please tick here ❑. No further discount given.

The total amount payable to BCS-FACS in **pounds sterling** is **£ 15 / 30 / 61 / 76** (delete as appropriate). I am paying by:

- ❑ Cheque made payable to **BCS-FACS** (**in pounds sterling**)
- ❑ Credit card via PayPal (instructions can be found on the BCS-FACS website)
- ❑ Direct transfer (in **pounds sterling**) to:

  Bank: Lloyds TSB Bank, Langham Place, London
  Sort Code: 30-94-87
  Account Number: 00173977
  Title of Account: BCS-FACS

If a receipt is required, please tick here ❑ and **enclose** a stamped self-addressed envelope.

Please send completed forms to:

Dr Paul P Boca
PO BOX 32173
LONDON N4 4YP
UK

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Kevin Lano
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Rob Hierons
Chair, FM and
Testing Subgroup

FACS is always interested to hear from its members and keen to recruit additional Committee members. Presently we have vacancies for officers to handle publicity and help with fund raising, liaise with other specialist groups such as the Requirements Engineering group and the European Association for Theoretical Computer Science (EATCS), and maintain the FACS website. If you are interested in helping the Committee, please contact the FACS Chair, Professor Jonathan Bowen, at the contact points below:

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F +44 (0)20 7815 7793
E info@bcs-facs.org.uk
W www.bcs-facs.org

You can also contact the other Committee members via this email address.

Please feel free to discuss any ideas you have for FACS or voice any opinions openly on the FACS mailing list [FACS@jiscmail.ac.uk]. You can also use this list to pose questions and to make contact with other members working in your area. Note: only FACS members can post to the list; archives are accessible to everyone at http://www.jiscmail.ac.uk/lists/facs.html .

Coming Soon in FACS FACTS....

TRain Column

Conference reports

Report on FM05 Industry Day

Report on FAST workshop

FACS Evening Seminars

Report on FM05 Grand Challenges Workshop

And More...

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