

# FACS

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Formal Aspects of  
Computing Science  
Specialist Group

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

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## 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.

Submissions to *FACS FACTS* are always welcome. Please visit the newsletter area of the BCS FACS website for further details (see <http://www.bcs.org/category/12461>).

Back issues of *FACS FACTS* are available for download from: <http://www.bcs.org/content/conWebDoc/33135>

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### BCS-FACS websites

BCS: <http://www.bcs-facs.org>

LinkedIn: <http://www.linkedin.com/groups?gid=2427579>

Facebook: <http://www.facebook.com/pages/BCS-FACS/120243984688255>

Wikipedia: <http://en.wikipedia.org/wiki/BCS-FACS>

If you have any questions about BCS-FACS, please send these to Paul Boca <[paul.boca@gmail.com](mailto:paul.boca@gmail.com)>.

**2012: Centenary of the birth of Alan Turing**

## ALAN TURING YEAR

**BCS-FACS/LMS****Joint Seminar**6<sup>th</sup> November 2012

Professor Jack Copeland

BCS Southampton Street  
London

Alan Mathison Turing was born on 23<sup>rd</sup> June 1912 in Maida Vale, London, United Kingdom. He was a mathematician and logician and is widely regarded as the father of computer science and artificial intelligence. During World War 2, Turing worked at Britain's codebreaking centre at Bletchley Park where he devised a number of techniques for breaking German ciphers. A fuller account of Alan Turing's life and achievements can be found on Wikipedia at: [http://en.wikipedia.org/wiki/Alan\\_Turing](http://en.wikipedia.org/wiki/Alan_Turing).

A Centenary Celebration of the Life and Work of Alan Turing is taking place this year – <http://www.turingcentenary.eu> – with a number of major events throughout the year. This will include a Turing Lecture which BCS-FACS is arranging in conjunction with LMS. The talk will be given by Professor Jack Copeland (The University of Canterbury, New Zealand) and entitled:

*The Mathematical Objection:  
Turing, Gödel, and Penrose on the Mind*

The talk will take place at the London offices of the BCS in Southampton Street on 6<sup>th</sup> November 2012. A poster is included on the next page.

**Programme**

5.30pm	Coffee/tea
6.00pm	Talk (chaired by Jonathan Bowen)
7.15pm	Questions
7.30pm	Drinks reception
8.30pm	Close



Formal Aspects of Computing  
Science Specialist Group



LONDON  
MATHEMATICAL  
SOCIETY

**BCS-FACS Evening Seminar**  
**Joint event with the London Mathematical Society**

**Tuesday 6 November 2012, 6:00pm**



Professor Jack Copeland  
(The University of Canterbury, New Zealand)

***The Mathematical Objection:  
Turing, Gödel, and Penrose on the Mind***

Is what the mind does always computable? What Turing called the 'Mathematical Objection' to machine intelligence suggests not. Turing's subtle and interesting treatment of the Mathematical Objection has a lot to teach us about his view of mind. Turing is often portrayed as a card-carrying computationalist, but he would, Professor Copeland suggests, disagree with the simple claim that the mind is a Turing machine. On Professor Copeland's interpretation of his response to the Mathematical Objection, Turing believes that the Objection has no force at all against machine intelligence, but not because the Objection is necessarily mistaken in its claim that what the mind does is not always computable.

The venue is the British Computer Society 1st Floor, The Davidson Building, 5 Southampton Street, London, WC2E 7HA. Refreshments will be available from 5.30pm.

The seminar is free of charge and open to everyone. If you would like to attend, please register at <https://events.bcs.org/book/286/>.

## Editorial

Welcome to the first issue of FACS FACTS for 2012 – the centenary of the birth of Alan Mathison Turing, who was born on 23<sup>rd</sup> June 1912.

A weekend's celebration of his life and achievements took place during 23<sup>rd</sup>–24<sup>th</sup> June 2012 and a short report and pictures from the talks is presented in this newsletter. This issue also contains announcements of some future events, together with an article by our occasional contributor, Tim Denvir.

As promised previously we continue, when possible, to keep you informed of activities concerning the BCS Academy. On 8<sup>th</sup> March 2012, I attended the BCS Member Groups Spring Convention where Professor Jim Norton presented an update of an important activity of the Academy: *Computing in the National Curriculum for Schools*. A brief account is presented in this issue. During the convention there was a workshop session on recording member events (specialist and local), the objective being an archive of recorded material which is available for all members. For example the outgoing president's address to the convention is available in video form (see later for link).

Many of FACS seminars take place in the offices of the British Computer Society in the Davidson Building, Southampton Street. These excellent facilities are conveniently situated in Central London close to Covent Garden and we would like to thank them for making these available to us.

***Margaret West***

**Editor, FACS FACTS**

## Computer Science Curriculum in Schools

On March 8<sup>th</sup> 2012 Professor Jim Norton (president of the BCS 2011–12) presented the opening address at the *BCS Member Groups Spring Convention*. During this address he explained the role of the BCS Academy in a recent initiative concerning the teaching of Computer Science in schools. The initiative arose from the announcement of a review, in January 2011 of the National Curriculum by the Secretary of State for Education, Michael Gove. The outcomes of this initiative were presented in the address and included the dropping of “harmful” ICT in the curriculum and the adoption of rigorous Computer Science in schools. The presentation also included an explanation of the role of *CAS (Computing At School)* whose members includes teachers, academics and representatives of industry and professional societies. The CAS Board is part of the BCS Governance structure within the BCS Academy of Computing, CAS itself having around twelve hundred members.

In January 2012 the Royal Society published the result of a major study ‘*Computing in schools, Shut Down or Restart*’. An information pack has been sent to every head teacher of a state maintained secondary school in England. Copies of the Royal Society report and a model Computer Science curriculum are included in the information pack which also contains a letter explaining the importance of Computer Science: support is sought for a schools network of teaching excellence in the subject.

The whole has been achieved by the BCS Academy of Computing in collaboration and cooperation across the computing, science and engineering communities. This includes groups such as *Next Gen Skills*, NESTA, CIHE, CASE, E4E, *Rewired State*, the Royal Society, the Royal Academy of Engineering, the Royal Society of Edinburgh and UKIE: there has also been support from CPHC and UKCRC. The role of international technology companies such as Microsoft, Google and MetaSwitch Networks was underlined as being responsible for the significant progress made and the speaker went on to explain the role of all the groups who have collaborated in the initiative.

Professor Norton mentioned in particular the importance In August 2011 of a speech by the Google Chairman - Eric Schmidt - who delivered the keynote MacTaggart lecture at the Guardian Edinburgh international TV festival. During his lecture Eric Schmidt criticised the UK Education system for its failure to capitalise on its record of innovation in science and engineering. In particular he said we were “*throwing away your great computer heritage*” by failing to teach programming in schools. Further, he said, “*I was flabbergasted to learn that today computer science isn’t even taught as standard in UK schools*”. As a result of the initiative (and the comments of Eric Schmidt) there has been a shift of public policy in the support of Computer Science education in schools.

A video of the presentation is at <http://vimeo.com/38268702> and further information about the Academy and an update of its activities can be found at the BCS Academy website: <http://academy.bcs.org>.

A question and answer session followed the morning presentations. There was a lot of interest in the proposed new curriculum for schools and one suggestion was that parents should make sure this was not forgotten by, for example “collaring School Governors”. The role of the Parents Teacher Associations was also important for making sure the matter was addressed by the school head and staff.

***Dr Margaret West***  
**University of Huddersfield**

## Rambling Thoughts on VLNI (Very Large Numbers Indeed)

Tim Denvir

I recently heard the following story about the physicist Paul Dirac. After he gave a paper at a conference, a member of the audience raised his hand and said, "I cannot understand the significance of the symbol  $\mu$  in the third equation on your last slide." Silence followed and, after a long pause, the chairman tentatively asked, "Professor Dirac, are you able to answer the question?" Dirac replied, "That was not a question, it was a statement." A scientific myth, perhaps, but I heard the story on BBC Radio 4, so it must be true, mustn't it.

Mild Asperger's syndrome such as this will be a familiar companion to many of us. One morning when I was waiting for a train on the London underground, a man approached me and asked, "Excuse me, what direction do the trains from this platform go?" "They go north," I replied. He laughed pleasantly and said, "Well, which way is north?" I checked which end of the platform displayed the green light, pointed to it and said, "That way." At this point my fellow traveller began to look a little less pleasant and I decided it was time to think fast and work out what he really wanted to know. "Er, where do you want to get to?" I said, and we soon parted amicably enough.

But to return to the legendary sayings of great scientists. It was, I believe, David Hilbert who declared, "God created the integers; the rest are inventions of the human mind," or something along those lines. One can understand his reasoning. Integers, so straightforward, are a model of things one can count, and the natural world is full of them (stars, planets, sheep etc.). But imaginary numbers are, well, imaginary and the Reals are also highly suspect. Alan Turing talked of "computable numbers" and we all know that the real line is full of numbers for which there is no rule or algorithm for generating their expansion, in decimal, binary or other ways. Indeed, the non-computable and non-algebraic (real numbers which are not the solution of some equation) numbers infinitely outnumber the computable and algebraic ones. The Reals are therefore packed full of numbers you cannot write down or define: the only way you know they "exist" is that assuming they do not leads to a contradiction. I suspect that it was philosophical contemplations of this kind that led David Hilbert to the conclusion that only the integers are truly "natural", real entities.

But even the integers include numbers one could never in practice write down or define, because we have only a finite quantity of paper (or other recordable electronic medium, blah blah) in the universe. Even if one could write a symbol on every particle of matter in existence, there are only about  $10^{43}$  of them: not much more than the back of an envelope, really. We would be hard put to find a means of expressing any random integer between 0 and  $10^{10^{43}}$ . Indeed, the

finite limit of  $256^{10^{43}}$  symbols is an absolute boundary to the volume of sentences with which we can express any thought whatsoever.

Consider the following Very Large Number Indeed, far larger than  $10^{10^{43}}$ , but still a finite integer. We define a sequence of operators:

$$G_0(n) = n+1$$

$$F_1(n, m) = G_0^m(n)$$

$$G_1(n) = F_1(0, n)$$

$$F_2(n, m) = G_1^m(n)$$

$G_0$  is Peano's successor,  $F_1$  is addition and  $F_2$  is multiplication. We define a sequence inductively:

$$F_{k+1}(n, m) = G_k^m(n)$$

$$G_{k+1}(n) = F_{k+1}(n, n)$$

So  $F_3$  is raising to the power. Denote  $10^6$  by  $\mathbf{M}$ ;  $G_4(\mathbf{M})$  is  $\mathbf{M}$  repetitively raised to the power of  $\mathbf{M}$  a million times over, a number so large it severely taxes the imagination. Finally, consider:

$$\mathbf{V} = \mathbf{G}_{\mathbf{M}}(\mathbf{M})$$

$\mathbf{G}_{\mathbf{M}}$  is the millionth operator in the sequence.  $\mathbf{V}$  ("Very Large Number Indeed") is a number of inconceivable magnitude, yet it is nonetheless an integer. If we represent the integers from 0 to  $\mathbf{V}$  by a line segment, the vast majority of the integers represented by those points on the line will be impossible to define on any piece of universal "paper". The integers cease to look like some naturally occurring set, like a model of things one may in any way "count".

So my contention is that the integers, too, are an invention of the human mind.

Turing, whose 100<sup>th</sup> anniversary is being much and rightly celebrated this year, pointed out that computable numbers are a countable subset of the Reals. Considerations of computable functions and recursive data-types whose semantic definitions are not invalidated by Cantor's theorem that no set can contain its own function space have led to various flavours of domain theory. But we still happily use the Integers as a model for computable integers, and countable subsets of more elaborate constructs. I wonder, do we really have the right to do so? And yet, any attempts I have seen to restrict precision and size of numbers in formal descriptions invariably lead to messy and cumbersome arguments and proofs. Perhaps we should just recognise that formal descriptions are idealisations, and remain aware of their consequent limitations.

**Tim Denvir**

[www.timdenvir.me.uk](http://www.timdenvir.me.uk)

**Peter Landin Annual Semantics Seminar:**  
***Unifying Theories of Programming***  
**Professor Sir Tony Hoare**

Peter Landin (1930–2009) was a pioneer whose ideas underpin modern computing. In the 1950s and 1960s, Landin showed that programs could be defined in terms of mathematical functions, translated into functional expressions in the lambda calculus, and their meaning calculated with an abstract mathematical machine. Compiler writers and designers of modern-day programming languages alike owe much to Landin's pioneering work.

Each year, a leading figure in the area of semantics will pay tribute to Landin's contribution to computing through a public seminar. This year's seminar will take place on 3<sup>rd</sup> December 2012 and will be given by Professor Tony Hoare (Microsoft Research).

**Programme**

5.15pm	Coffee
6.00pm	Welcome and introduction
6.05pm	Peter Landin seminar
7.20pm	Drinks reception
8.30pm	Close

## ***Turing's Worlds*** **Oxford, 23<sup>rd</sup>–24<sup>th</sup> June 2012**

***Turing's Worlds*** was an event that covered the life and achievements of Alan Turing whose centenary was on 23<sup>rd</sup> June 2012. It was held over the weekend of 23<sup>rd</sup>–24<sup>th</sup> June 2012 at Rewley House in Oxford. A number of talks covered aspects of Turing's life and achievements from varying points of view.

### **Overview**

The *Turing's Worlds* event was organized in association with the British Society for the History of Mathematics (BSHM) and the Department of Continuing Education at Oxford University.

Alan Mathison Turing was born on 23<sup>rd</sup> June, 1912, exactly a hundred years before this weekend meeting, which celebrated his life and achievements. Although probably most well-known to the public for his work at Bletchley Park in the pioneering days that saw the birth of modern practical computing, Turing achieved fame well before World War II with a seminal account of theoretical computation and his solution to the *Entscheidungsproblem*. As such, he could be considered the founding father of formal methods. He was also an Olympic-class marathon runner, who refused to conform to the narrow sexual standards of the day and was persecuted for it, while still undertaking fundamental and seminal research on Artificial Intelligence, computer programming, and even mathematical biology.

The event was co-organized by: Jonathan Bowen (BCS-FACS/London South Bank University), Martin Campbell-Kelly (University of Warwick), Terry Froggatt (BSHM), Bob Lockhart (Department of Continuing Education, University of Oxford), Robin Wilson (BSHM/Open University).

### **Report**

The *Turing's Worlds* event was briefly introduced by Jonathan Bowen, who noted that Turing was to be found in an in-flight magazine, an unusual "honour" for a computer scientist. He introduced Sue Black who set the scene with a view of Turing's influence on today's society, especially online. She has been a complainer for Bletchley Park using social media. The talk included the high-



Figure 1. This slate sculpture of Alan Turing with an Enigma machine is by Stephen Kettle – <http://www.stephenkettle.co.uk> – and can now be seen at Bletchley Park.

profile sale of some of Turing's papers recently, which have been saved for display at Bletchley Park where Turing worked during World War II.

Next, Robin Whitty gave a delightful and erudite yet still very accessible mathematical talk, skirting around decidability and the associated *Entscheidungsproblem* challenge posed by the mathematician David Hilbert in 1928, using some well-illustrated example problems. John Tucker continued with a more historical view, considering the Church-Turing Thesis of Alonzo Church (Turing's doctoral supervisor at Princeton in the USA) and Turing himself, independently formulated and providing a theoretical basis for what is computable.

After lunch on the first day, Samson Abramsky reflected on issues concerning theoretical computer science today and the effects of Turing's foundational work. Cliff Jones considered Turing's contributions to programming, include very early program proofs, and how this may or may not have influenced subsequent researchers in the field of formal methods, based on personal research into possible links between the people concerned, including Tony Hoare (<http://t.co/LyH8STq>). Martin Campbell-Kelly covered Turing's early computer hardware contributions, especially with respect to the ACE (Automatic Computing Engine), designed by Turing at the National Physical Laboratory after World War II. It was a more efficient computer design than others of its time, but required more complex programming techniques.

Jack Copeland, also at a Turing-related meeting in Manchester, founder of *The Turing Archive of the History of Computing* (<http://www.alanturing.net>), and a prolific author on Turing-related subjects, gave a lively, polemical and convincing presentation, positing the probability that Turing's alleged suicide would not have been accepted as easily now as it was in 1954 without further investigations. This topic was covered on the United Kingdom national news by the BBC at around the same time as the *Turing's Worlds* meeting (<http://www.bbc.co.uk/news/science-environment-18561092>). Turing had a laboratory at home where he used cyanide, which could have accidentally ingested rather than deliberately using it to commit suicide. In particular, the half-eaten apple by his bed that was supposed to be laced with cyanide was never tested for the substance. For an audio recording of Jack Copeland discussing this subject, freely available on the BBC website, see: <http://www.bbc.co.uk/news/science-environment-18562183>.

Stephen Wolfram, founder and CEO of Wolfram Research and inventor of the mathematical software Mathematica, ended the afternoon sessions with a presentation considering what Turing could have discovered given more time, including many illustrations in the talk. Before dinner, a reception sponsored by Oxford University Press, which has published a number of books relating to Turing, was held in the common room at Rewley House. A celebration birthday cake was cut by the distinguished historian of mathematics Ivor Grattan-Guinness, who happens to share his birthday with Turing. After dinner in the evening, Doron Swade, formerly of the Science Museum in London and an expert on the 19<sup>th</sup> century computing pioneer Charles Babbage, compared the contributions of Babbage, his colleague Ada Lovelace, and Turing. He noted

that many of the ideas are compatible at a theoretical level, despite differences in era and technology.

The following day started with considerations of Turing's scientific contributions towards the end of his life. He was a founding father of two concepts, Artificial Intelligence (AI) and morphogenesis. AI has been pursued in computer science for a number of decades and morphogenesis is showing increasing promise now in explaining and simulating biological processes and patterns. As usual, Alan Turing was ahead of his time in both areas, providing contributions in his own unique way. Teresa Numerico considered the role and interpretations of the now so-called Turing Test, proposed by Turing and still an important idea in AI today, approaching the topic from a philosophical viewpoint. Philip Maini presented the progress on morphogenesis since Turing's ideas that he formulated shortly before his death. Turing produced simple mathematical equations that explained the complex patterns that can develop in nature. While the precise equations may not have been those used in reality, the idea that simple laws and rules can lead to great complexity is still very much alive and advancing today.

A highpoint of the event was the presentation on Bletchley Park, where Turing undertook his wartime work decrypting German codes using a combination of mathematical insight, practical ingenuity in mechanizing these ideas, and sometimes luck in obtaining the correct "crib" to decode an initial message. Bletchley Park has been in need of financial support to save it for the nation in its current role as a heritage site and museum location for the National Museum of Computing. Three speakers contributed to the presentation. Simon Greenish was the former Director of the Bletchley Park Trust and Iain Standen has recently taken on this role. They gave an overview of recent developments at Bletchley Park and hopes for the future.

The third speaker was a former Wren who worked in Hut 11 at Bletchley Park, operating the "bombe" decryption machines that were devised by Turing ([http://en.wikipedia.org/wiki/Jean\\_Valentine\\_\(bombe\\_operator\)](http://en.wikipedia.org/wiki/Jean_Valentine_(bombe_operator))). The overall organization of Bletchley Park was highly compartmentalised, with only a very small number of people having a full understanding of its complete operation. While Jean Valentine never met Turing, she gave a fascinating and often amusing insight into life at Bletchley Park at the time when Turing was there. She is now a guide at Bletchley Park, demonstrating the reconstructed bombe that is on view at the site (<http://www.youtube.com/watch?v=oex-9IkQRcg>). Jean Valentine's lively and seemingly extemporised presentation, together with the audience's appreciative response to it, was a highlight of the overall event for many that were there.

After lunch, the Oxford-based mathematician Andrew Hodges, maintainer of *The Alan Turing Home Page* (<http://www.turing.org.uk/turing>) and just back from another Turing-related meeting in Cambridge, gave an interesting presentation of his experience in writing Turing's definitive biography, *Alan Turing: The Enigma*. This was followed by Ivor Gratton-Guinness who presented an analysis of the role of the Cambridge and Manchester mathematician Max Newman (1897–1984) in Turing's working life.

The meeting ended with Darrel Ince comparing the research and publishing environment of Turing's day with the much more pressured and commercially oriented situation today. Turing thrived on the freedom he was given and this is much more difficult to achieve in the academia of today. The number of papers produced by Turing was very low by today's metrics-driven standards. Yet a good percentage of them were seminal in nature, helping to establish fields that did not exist previously.

Overall, the meeting was highly successful with a very wide-ranging set of presentations covering Turing's life, his work, and his legacy. It was just one of a number of events in the UK and elsewhere held during 2012 to celebrate Turing's centenary year (<http://www.turingcentenary.eu>). While there is no documentary evidence that Turing ever actually visited Oxford (although it is quite likely that he did at some point), Turing's biographer Andrew Hodges is a long-time mathematics researcher based in Oxford and Jack Copeland, another authors of a number of Turing-related books, undertook a philosophical doctorate at the Mathematical Institute in Oxford.

## **Programme**

The programme of talks is included below for completeness. A book associated with the *Turing's Worlds* event and a similar Turing-related event in Cambridge is planned for 2014, the 60<sup>th</sup> anniversary of Alan Turing's death.

### **Saturday, 23<sup>rd</sup> June 2012**

*Welcome address*

Jonathan Bowen, London South Bank University

*Turing and the Public Consciousness: Turing 2.0(12)*

Sue Black, University College London

*Decidability: The Entscheidungsproblem*

Robin Whitty, London South Bank University

*History of the Turing Hypothesis: The Universal Machine*

John Tucker, Swansea University

*Turing in the age of the Internet and the quantum computer*

Samson Abramsky, Oxford University

*Turing in the History of Software*

Cliff Jones, Newcastle University

*Turing in the History of Computers*

Martin Campbell-Kelly, Warwick University

*Turing in the Modern World*

Jack Copeland, University of Canterbury, New Zealand

*What Alan Turing might have discovered*

Stephen Wolfram, Wolfram Research, USA

*Congruent Worlds: Turing, Lovelace and Babbage*  
Doron Swade, Royal Holloway, University of London

### **Sunday, 24<sup>th</sup> June 2012**

*AI and the Turing Test*  
Teresa Numerico, University of Rome 3, Italy

*Morphogenesis Then and Now*  
Philip Maini, Oxford University

*Action This Day*  
Simon Greenish, Iain Standen, & Jean Valentine, Bletchley Park

*Decoding Alan Turing: A Biographer's Experience*  
Andrew Hodges, Oxford University

*Why is Max Newman Part of the Turing Story?*  
Ivor Grattan-Guinness, Middlesex University

*Turing Our Contemporary*  
Darrel Ince, Open University

### **Further information**

Facebook: <http://www.facebook.com/event.php?eid=270894109620718>

Audio: <http://podcasts.ox.ac.uk/units/department-continuing-education>

Flickr: <http://www.flickr.com/photos/86372217@N00/sets/72157630377243604/>

Formal Methods Wiki: [http://formalmethods.wikia.com/wiki/Turing%27s\\_Worlds](http://formalmethods.wikia.com/wiki/Turing%27s_Worlds)

### **Photographs**

A number of photographs were taken at the event by Sheila Mawby and these are available on Flickr as [Turing's Worlds, Oxford, 23–24 June 2012](#). A selection of these are included on the following pages.

*Photographs courtesy of and © Sheila Mawby*



Figure 2. Group photograph of some of the speakers and organisers.  
Left to right: Bob Lockhart, Stephen Wolfram, Robin Wilson, Sue Black, Jonathan Bowen, Ivor Grattan-Guinness, Rob Whitty, Martin Campbell-Kelly, Terry Froggatt, Philip Maini, Cliff Jones.

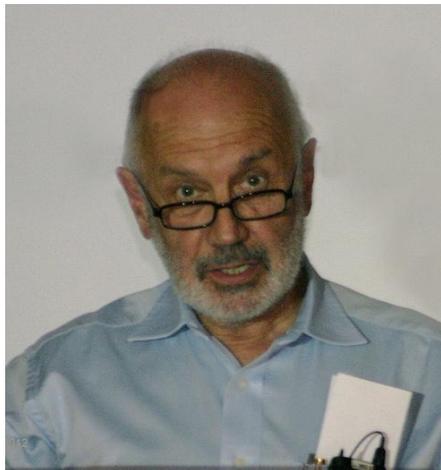


Figure 3. Cliff Jones speaking on Turing and software.



Figure 4. Jonathan Bowen introducing the meeting.



Figure 5. Centenary birthday cake for Alan Turing.



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Figure 6. Speakers informally chatting at the *Turing's Worlds* event. Left to right: Ivor Grattan-Guinness, Rob Whitty, Philip Maini (partially obscured), Stephen Wolfram, and Jonathan Bowen.



Figure 7. Photomontage of pictures from the *Turing's Worlds* event. See <http://www.flickr.com/photos/86372217@N00/sets/72157630377243604/> for larger versions.

For further information about *Turing's Worlds* online that is also updatable, see under: [http://formalmethods.wikia.com/wiki/Turing%27s\\_Worlds](http://formalmethods.wikia.com/wiki/Turing%27s_Worlds)

**Prof. Jonathan P. Bowen**  
**London South Bank University**

## ***FACS FACTS in 2013***

### Call for Submissions

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 Margaret West <[m.m.west@hud.ac.uk](mailto:m.m.west@hud.ac.uk)>, the Newsletter Editor.

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

## Recent and Forthcoming Events

BCS FACS Seminars: Unless stated otherwise, these take place at: BCS London Offices, 1st Floor, The Davidson Building, 5 Southampton Street, London WC2E 7HA. Major formal methods events are also included below.

Turing's Worlds  
Oxford, UK  
23–24 June 2012  
<http://t.co/cAwIEXT>  
(Weekend event in association with British Society for the History of Mathematics and the Department of Continuing Education at Oxford University.)

FM 2012  
18<sup>th</sup> International Symposium on *Formal Methods*  
Paris, France  
27–31 August 2012  
<http://fm2012.cnam.fr>

Jack Copeland  
*The Mathematical Objection: Turing, Gödel, and Penrose on the Mind*  
FACS/LMS Turing lecture  
London, UK  
6 November 2012  
<https://events.bcs.org/book/286>  
(The FACS AGM will be held at 5pm beforehand.)

Tony Hoare  
*Unifying Theories of Programming*  
Peter Landin Annual Semantics Seminar  
London, UK  
3 December 2012  
<http://www.bcs.org/content/ConWebDoc/47345>

Jonathan P. Bowen  
*The Industrial Use of Formal Methods: Experiences of an Optimist*  
Joint with Advanced Programming Specialist Group Seminar  
London, UK  
10 January 2013  
<http://www.bcs.org/category/16473>

For further conference announcements, please visit the Formal Methods Europe (FME) website ([www.fmeurope.org](http://www.fmeurope.org)), the European Association for Theoretical Computer Science website ([www.eatcs.org](http://www.eatcs.org)) and the Formal Methods Wiki Virtual Library (<http://formalmethods.wikia.com/wiki/Meetings>).

## FACS Committee



Formal Aspects of Computing  
Science Specialist Group



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Jonathan Bowen  
FACS Treasurer and  
ZUG Liaison



Paul Boca  
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Subgroup

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Tom Melham  
LMS Liaison Officer

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

BCS-FACS  
c/o Professor Jawed Siddiqi (Chair)  
Sheffield Hallam University  
Email [info@bcs-facs.org.uk](mailto:info@bcs-facs.org.uk)  
Web [www.bcs-facs.org](http://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](mailto: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 next in FACS FACTS...*

Conference reports

Details of upcoming BCS-FACS Evening Seminars