# Grand Challenges of Informatics

**An** Academia Europaea

# $+$ Charles Simonyi $+$

## John von Neumann Computer Society
## International Symposium

### Budapest, Hungary, 19-20 September 2006

**August 8, 2006 Version**
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## Contents

## 1 The Event

- **Charter of the Informatics Section of Academia Europaea:** The charter includes the propagation of awareness of the classical and emerging disciplines of informatics and their interfaces to other fields of science and humanities.

- **Target Audience:** In line with the charter this symposium is "programmed" to be of interest to these groups of participants:

  - **Computer Scientists in General:** We are in particular aiming also at researchers from *Armenia, Belarus, Bulgaria, The Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldava, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkey* and *Ukraine*. The Informatics Section shall endeavour to bring up to 40 such scholars to attend the symposium as *Charles Simonyi Fellows*.

  - **Members of other AE Sections:** The first day (one topic) sessions and especially the second day (two topic) sessions ought appeal to the intellectual curiosity of members of other AE sections: Mathematics, Physics and Engineering, Linguistics, and the Biology sections.

- **Aims:** For the first day to survey aims & objectives of the VSTTE[1] effort. For the second day morning to highlight some esoteric new research avenues, and for the second day afternoon to highlight apparent seamless borders between computer science and mathematics.

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[1] Verified Software: Theories, Tools and Experiments (http://www.vstte.ethz.ch )

- Objectives: For the first day to ensure a Pan European VSTTE effort. For the second day morning to similarly broaden the scope of research in new areas, and for the second day afternoon to do likewise!
- Implications: This is not a conventional computer/computing science/informatics symposium. Speakers are presenting overviews of recent years of their work.

# 2 The Symposium Programme

## 2.1 Tuesday 19 September 2006

- Verified Software, I                                                        Morning Session:
  - Opening & Welcome                                                         8:45-9:00
  - The Ideal of Program Correctness: Sir Tony Hoare:                         9:00-9:45
  - A Million Lines of Verified Code:[2] Jim Woodcock:                        9:45-10:30
  - 10:30-11:00 Refreshment Break
  - Have we Learned from the Wasa Disaster (?): Jean-Raymond Abrial:          11:00-11:45
  - Temporal Annotations and Their Validation: Amir Pnueli:                   11:45-12:30
- Lunch                                                                       12:30-13:45
- Verified Software, II                                                       Afternoon Session:
  - The German VeriSoft Project: Wolfgang J. Paul                            13:45-14:30
  - Model Checking, Theorem Proving, and Abstract Interpretation
    The Convergence of Formal Verification Technologies: Thomas Henzinger    14:30-15:15
  - Panel: Pan-European Collaboration:[3]                                     15:15-16:30
  - Refreshment Break                                                         16:30-...
- Informatics Section Members Meeting                                         16:45-18:30
- Symposium Dinner                                                            19:30-...

## 2.2 Wednesday 20 September 2006

- Unconventional Grand Challenges                                             Morning Session:
  - Opening & Welcome:                                                        8:45-9:00
  - Quantum Computing: Jozef Gruska:                                          9:00-9:45
  - Biocomputing: Luca Cardelli:                                              9:45-10:30
  - Refreshment Break                                                         10:30-11:00
  - From Computable Functions to Definable Systems, Wolfgang Reisig:          11:00-11:45
  - Economics and Game Theory: Krzysztof R. Apt:                             11:45-12:30
- Lunch                                                                       12:30-14:00
- Computer Mathematics                                                        Afternoon Session:
  - Main Issues of Computer Mathematics: Henk Barendregt:                    13:45-14:30
  - Can We Trust Floating-point Numbers (?): Paul Zimmermann:                14:30-15:15
  - Refreshment Break                                                         15:15-15:45
  - Computer Algebra: Joachim von zur Gathen:                                15:45-16:30
  - Formalisation (Proof-checking): Laurent Théry:                           16:30-17:15
- Informatics Section Members & Speakers Dinner                              19:00-...

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[2]A presentation of the VSTTE Grand Challenge project

[3]The idea of the panel is to engage scientists from all across Europe onto the panel and into the concerns of VSTTE: Verified Software: Theories, Tools and Experiments.

# 3   Sponsors



## 3.1   Main Sponsor

- Dr. Charles Simonyi[4] who has graciously donated a generous gift primarily aimed at covering participation of young scholars from East Europe.

## 3.2   Organsational & Operational Sponsors

- Academia Europaea (AE):AE[5] is providing financial support for the participation of non-AE-member invited speakers as well as providing administrative and publicity support.
- The John von Neumann Computer Society (NJSZT): NJSZT[6] is providing generous organisational on-site support.

## 3.3   Operational Sponsors

- Budapest University of Technology and Economics (BME):BME[7] is providing logistics support as well as housing the symposium event.



- The Informatics Section of AE (AE/IS):AE/IS[8] is "master-minding" the contents of the event. About a dozen of its members are either speaking at the event or organising it - at no cost to AE. Hence we thank their home institutions.

# 4   Practicalities

- Venue:
    - Budapest University of Technology and Economics[9], Müegyetem rkp. 3-9. H-1111 Budapest, Hungary
- Local Organiser: Dr. Péter Szeredi[10], szeredi@cs.bme.hu.
- Registration: No registration fee. Admission is free and open.

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[4]INT∃NTION∀L SOFTWARE^TM (http://intentsoft.com/), Bellevue, WA, USA
[5]http://www.acadeuro.org/
[6]http://www.njszt.hu/neumann/neumann.head.page?nodeid=210
[7]http://www.bme.hu/en/
[8]http://www.iis.ee.ic.ac.uk/~e.gelenbe/AEInformatics.html
[9]http://www.bme.hu/en/
[10]Budapest University of Technology and Economics, Faculty of Electrical Engineering and Informatics Department of Computer Science and Information Theory, Goldmann György tér 3. Budapest, bldg. V2, 1st floor, room 136. Phone: (+36 1) 463 2986 Postal address: H-1521 Budapest P.O.Box 91. http://www.cs.bme.hu/~szeredi/english/index.html

- You must, please, register with the organisers:
    * **TO:** szeredi@cs.bme.hu
    * **CC:** bjorner@gmail.com

# 5 Scholarships — URGENT: Apply Now!

- Academia Europaea, thanks to a private donation from Dr. Charles Simonyi, offers a limited number (up to 35 or so) scholarships to partially or, in a few cases to fully, support the participation of you scholars, having or going for a PhD in the subject areas of the symposium.
- Only scholars from *Armenia, Belarus, Bulgaria, The Czech Republic, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldava, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia* and *Ukraine* can apply.
- Application: Please use the below template and fill in information for all 13 items in order to apply. Do it now! First come first serve!

```
APPLICATION FORM - Pls. submit before August 20
================   Being late, after that may be risky

Personal information
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1. Full name
2. Birth date
3. Birth place
4. Nationality
5. Passport number, expiry date, where issued
6. Whether you need a visa to enter Hungary
7. Full work as well as home address
8. Telephone number(s) and e-mail address (one)

Professional information
-----------------------
9. Educational background:
        9.1 Highest degree obtained
        9.2 When, 9.3 where, and 9.4 subject
10.Current research interests
        Preference will be given to applicants
        whose interests match the topics of the
        Symposium
11.Most important publications (max. 5)

Estimated travel budget
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12. Cost of train or airplane, return to Budapest
13. Possible visa expenses
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- For successful applicants the AE/IS will endeavour
    - to partially or fully cover travels expenses (see item 12. above) ,
    - to cover three (3) nights of hotel,
      if two applicants are willing to share hotel room that is fine,
    - to cover meal expenses from Monday noon to Thursday noon and
    - to cover possible visa expenses (see item 13. above).

    Please note:

    - Participants living in Hungary will get support for all conference meals, but no hotel and travel costs. We may consider exceptions.

- Please send application, properly filled out, NOW, to organisers:
    - TO: szeredi@cs.bme.hu
      **and**
    - TO: bjorner@gmail.com