ICTEAM Best Thesis Award 2015

Axel van Lamsweerde

ICTEAM Young Researchers day

Modave, 26/05/2015
What's that?

- **Objectives**
  - Recognize outstanding achievements within ICTEAM
  - Promote high-quality (doctoral) research

- **Granted yearly**
  - Thesis defended the year before
  - Promoter must be member of ICTEAM

- **Selection committee**
  - Appointed each year by ICTEAM Executive Board
  - Strict rules for conflicts of interest
  - Domain coverage
    - 3 ELENs + 2 INGIs + 2 INMAs
This year ...

- 5th instance
- 8 applications
  - 5 (ELEN) + 2 (INMA) + 1 (INGI)
- Warmest thanks to Selection Committee
  - François Glineur (INMA)
  - Jerome Louveaux (ELEN)
  - Claude Oestges (ELEN)
  - Jean-Pierre Raskin (ELEN)
  - Paul Van Dooren (INMA)
  - Peter Van Roy (INGI)
  - Axel van Lamsweerde (INGI, Chair) + Nathalie Ponet!
Input material

- Thesis manuscript
  - Special scrutiny on Introduction, Conclusion
- Thesis report
  - When needed: clarifications by Jury Chair
- Two recommendation letters
  - Essential piece!
- CV, pub list
- Motivation letter
Evaluation criteria

- Novelty of results, of approach
  - Strength & variety of contributions
- Significance of problem, of solution
  - Contributions to technology, to society
- Validation? Impact? (effective or potential)
- Quality of presentation
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- Quality of presentation
- Strength of recommendation letters
  - Where from, substance & length, not co-author?
- Quality of publications (preferred over quantity)
  - First author? Many co-authors?
- Degree of autonomy
- Applicant’s vision on contribution (from motivation letter)
Process followed

- **Two-step process**  (as initiated by Michel Gevers)
- **Step 1: Establish shortlist**
  - Every committee member studies entire input material
  - Writes report arguing **PROS & CONS** of each thesis
  - Concludes by recommending 2-3 names for shortlist (ranked)
  - Chair synthesizes reports and sends result to members
  - *First meeting* to ... review individual reports; match individual rankings; discuss & agree on shortlist
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- **Step 2: Select winner**
  - Based on agreed evaluation criteria
  - After in-depth reconsideration of material from shortlist
  - *Second meeting* for decision *by consensus*
    (3 weeks after 1st meeting)
Major challenge: comparing apples and oranges

- The good news: 8 excellent theses
  - with *good* to *impressive* to *outstanding* publication record !!
  - trend to be encouraged !
- In quite different areas
- Different *types* of contributions (inherent to ICTEAM)
  - *from* deep mathematical theories & techniques ...
  - ... *to* well-engineered artefacts
- Respective strength criteria not necessarily comparable
Outcome this year:
- one winner
- one runner up
Runner up

Maxime Taquet

Multi-Fascicle Models of the Brain Microstructure for Population Studies: Acquisition, Estimation, Registration and Statistical Analysis

Supervisors: Benoît Macq & Simon Warfeld (Harvard)
Novel imaging and modeling techniques to analyze the brain microstructure
- Answer important questions in diagnosis and treatment of neurological disorders (e.g. autism)
- High potential impact (modulo experimental validation)
- Deep combination of mathematical & algorithmic aspects with medical knowledge & challenges
- Published in best journals
- Results already used by others in variety of projects
  - New avenue for research
- Recognition through multiple international awards
- High autonomy

Maxime Taquet
... and the winner is ...
Nicolas Boumal

*Optimization and Estimation on Manifolds*

Supervisors: Pierre-Antoine Absil & Vincent Blondel
Theoretical solutions to complex problems in optimization on Riemannian manifolds
- Technical depth
- Multiplicity of contributions in algorithmic optimization, statistical estimation, numerical matrix completion
- Broad applicability in diverse areas
  - computer vision, graphics, robotics, manifold learning, etc

Practical support through the ManOpt toolbox
- Well-engineered, easy-to-use
- Independently used by others for numerical experiments

Beautifully written thesis
Published in excellent journals & conferences, highly cited
High autonomy
Congratulations from all of us!