

Formalize or Improvise Best Practices for Ph.D. projects

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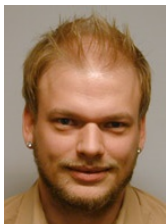
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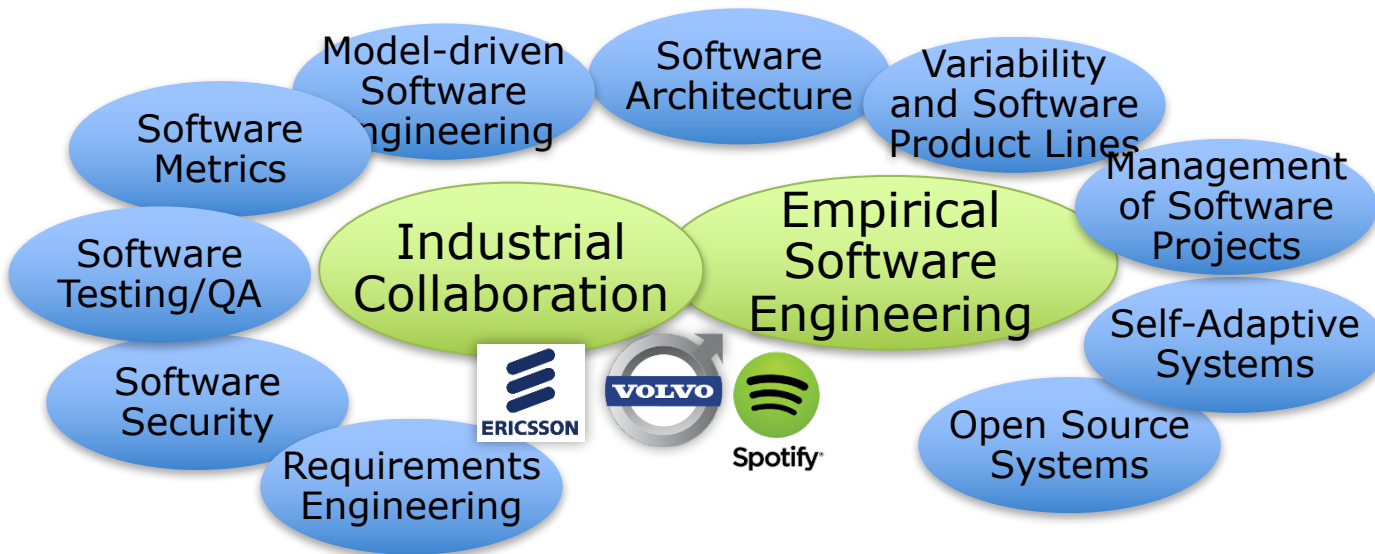
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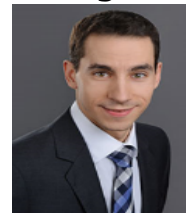
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My background

- PhD student (1992-1997) at Leiden University, Netherlands
 - Spent 1 year in UK (Oxford and Imperial/London)
- Visiting Researcher in Melbourne (Austr), Lille (France)
- Supervisor to 14 PhD students
 - TU Eindhoven & Leiden, Netherlands, Sweden
- External examiner (15 Ph.D. students)
 - Finland, France, Sweden, U.K, ..
- Currently:
 - Managing 9 lecturers from Uganda as Ph.D. students in Sweden

Different Constellations



- **Topic wise:**
 - Formal methods – Empirical SE – Start-up's
- **Sandwich students**
 - Industry – University
 - Uganda – Sweden
- **Part-Time student**
 - Teaching at Polytechnic (3 days) and doing research (2 days)
- **Co-supervision**
 - Uni-Spain – Uni-Netherlands
 - Uni-Australia – Uni-Sweden

Formalize or Improvise

Netherlands

- 4 year
- 1 mandatory seminar/year
- Only starts if 4 years of funding are available at start of project

Sweden

- 5 (4+1) year
- Mandatory 40-60 EC over 4 years
- Mandatory: 'examiner': person that performs QA on project – from day 1.
- IT-system for monitoring progress
- Yearly progress meeting



NL-BP: Common Training Schools

- Universities in Netherlands share graduate schools around broad thematic areas
 - Programming & Algorithms, HPC & Imaging, AI & Knowledge systems
- These schools organize one 3-day and one 5-day thematic training week each year
 - + Pooling of resources
 - + Exposure to other research groups / views on research area

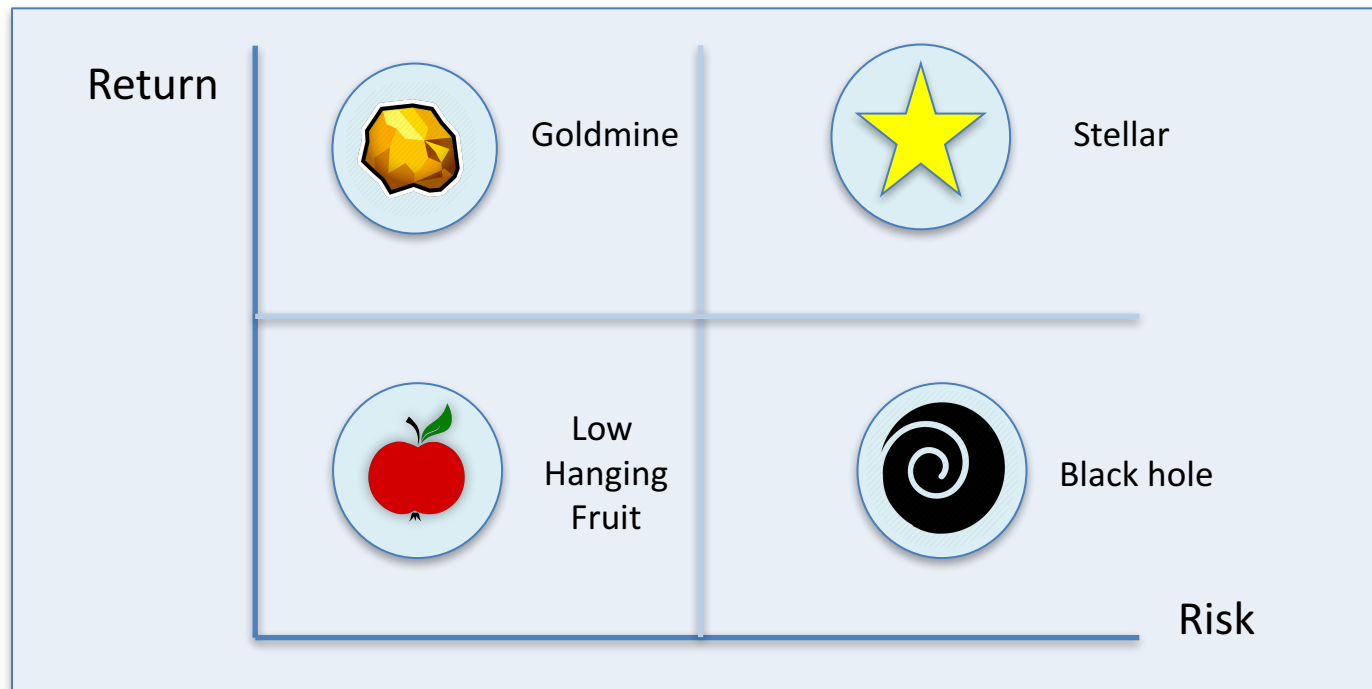


Best Practices: Recruitment

- Never ever do alone –
also not if you are a very experienced professor
- Invest time in top candidates
 - Ask them to perform representative tasks during interview visit (summarizing/writing, analyzing, presenting)
- Pay attention to personality-match between candidate and supervisor
 - Esp. communication-match
- Teach PhD students how to recruit!

Best Practices: Research Design

- “Shoot for the stars” & Low hanging-fruit
- Think: Portfolio, Risk and Return



SW-Best Practice: Examiner

- At the start of a project, the supervisor needs to appoint an **'examiner'** – an independent third party looking at the PhD-project.

Ideally in same working-environment
(informal chat at coffee-machine)

The duties of this examiner are:

- quality assurance
 - monitor progress
 - identify bottlenecks
 - benchmark against other supervisors
- solve disputes
- increases 'transparency'



Social embedding of PhD students



- Social Networking
 - In academic community
 - student volunteering at conferences
 - summer schools
 - in 'office' community research group
- Senior PhD students mentor novice PhD students
 - In 'local' culture (housing, recreation, ...)
 - 'hanging-in there' / mobilizing social-support
 - Dealing with supervisors

Training / Personal Development

- Ph.D. student
 - Look at needs of individual
 - Technical or soft-skills
 - Networking

- Supervisor
 - “Get feedback early and often”
 - but from whom?
 - organize ‘intervision’?
 - select your own training/mentor



Best Practice

- Ph.D. examination:
 - Have both public and closed examination
 - Public examination is always more ‘polite’ / can be short
 - Feedback for supervisor from external examiner

Summary & Final Remarks



- Wide range of constellations* require tailoring to needs
 - *: background, duration, funding
- Hardly ever ‘economies of scale’: numbers are too small
- Best Practices:
 - Joint schools
 - Examiners
 - Organize feedback for supervisors
- Post-PhD career-stage of Postdoc is **harsh**
 - Can we do anything as a community/industry to improve this?

Ph.D. students supervised/in progress:

- Arif Nurwidyantoro (Joint with Prof. Jon Whittle, Monash Univ, Australia), started summer 2017, working topics: automated program understanding & algorithmic bias.
- Grace Bugembe (joint with Raymond Mugwanya and Regine Hebig), started 2016, working title: Characterization and Measurement of Capabilities and Processes of Software Start-ups in Emerging Ecosystems, expected completion: 2020.
- Rodi Jolak, started April 2015, working title: *Understanding Software Design for Creating better Design Tools*, Gothenborg Univ.
- Truong Ho Quong, started March 2014, working topic: *A study of UML practices in open source projects*, Gothenborg Univ,
- Dave Stikkolorum (part-time: started 2010-planned 2018), *Didactics of teaching software design*, Leiden University
- Ana Fernandes Saez (joint with Marcela Genero, Ciudad Real; expected Q2 of 2018), *Studying the effect of modelling in software Maintenance*, Leiden University
- Bilal Karasneh, *An online corpus of UML Design Models: construction and empirical studies*, 7 June 2016, Leiden, Netherlands
- Hafeez Osman (Government of Malaysia), *Interactive scalable condensation of reverse engineered UML class diagrams for software comprehension*, defence: March 2015, Leiden, Netherlands
- Ramin Etemaadi (Omeca, SenterNovem), *Quality-driven multi-objective optimization of software architecture design*, defence: 11 Dec 2014, Leiden, Netherlands.
- Werner Heijstek (CapGemini funded), *Architecture Design in Global and Model-centric Software Development*, defence: 5 Dec 2012, Leiden, Netherlands
- Ariadi Nugroho (Finesse, LIACS), *The Effects of UML modelling on the Quality of Software*, defence 21 October 2010, Leiden, Netherlands
- Egor Bondarev (TUE, Space4U, joint with Peter de With, Johan Lukkien); defence 22 december 2009
Design-Time Performance Analysis of Component-Based Real-Time Systems
- Christian Lange (TUE, Empanada); *Assessing and Improving the Quality of Modeling*, defence 24 October 2007, Eindhoven, Netherlands.
- Giovanni Russello (TUE, SACC, joint with Maarten van Steen); *Separation and adaptation of concerns in a shared data space*, defence: 2001 - 27 June 2006, Eindhoven, Netherlands

Co-supervisor to:

- Mohamad Mousavi (TUE, SACC, joint with Michel Reniers), Ph.D. defence: 26 September 2005)
- Evgeni Eskenazi (AIMES, with Dieter Hammer), defence: Fall 2004
- Alexandre Fioukov (AIMES, with Dieter Hammer), defence: Fall 2004