

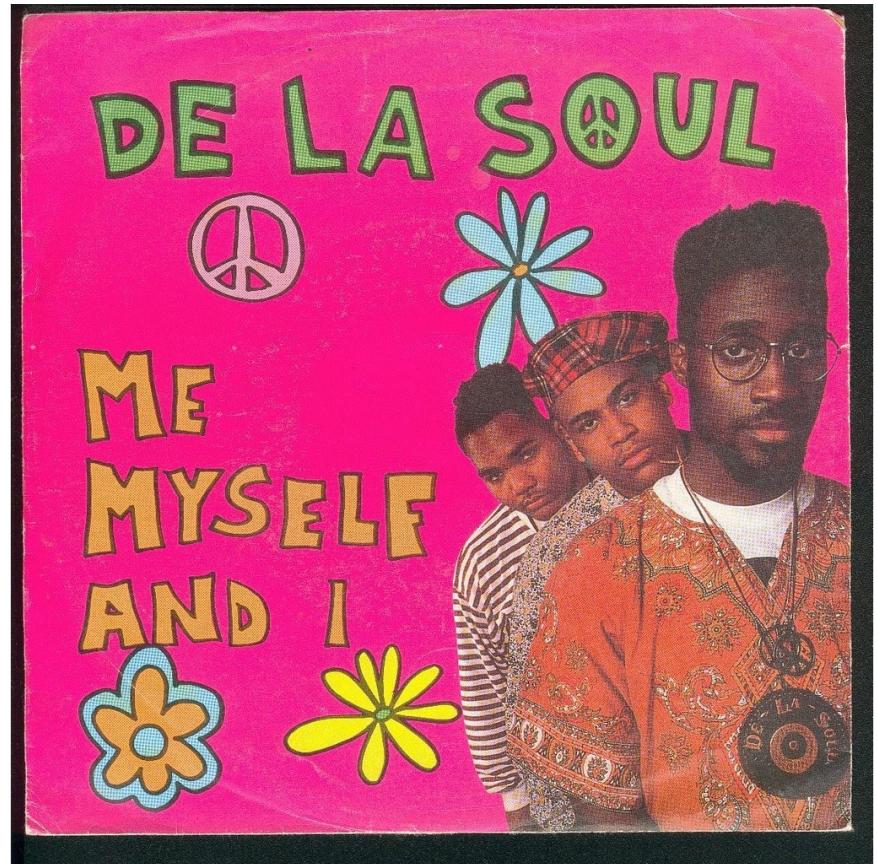
DAT255 - SOFTWARE ENGINEERING PROJECT

ME MYSELF AND I

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GitHub:
[hburden](https://github.com/hburden)



STAFF

Jan-Philipp Steghöfer, examiner
Rodi Jolak, Support & Lecturer

Student supervisors

Guest lecturers: Cybercom, Spotify, ...

TODAY

Software Engineering

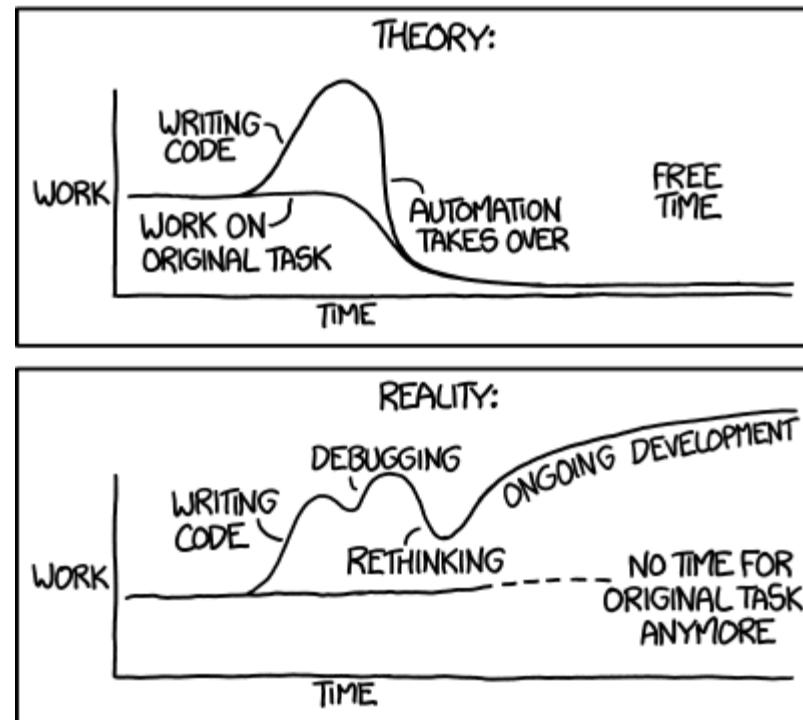
Course content
and structure

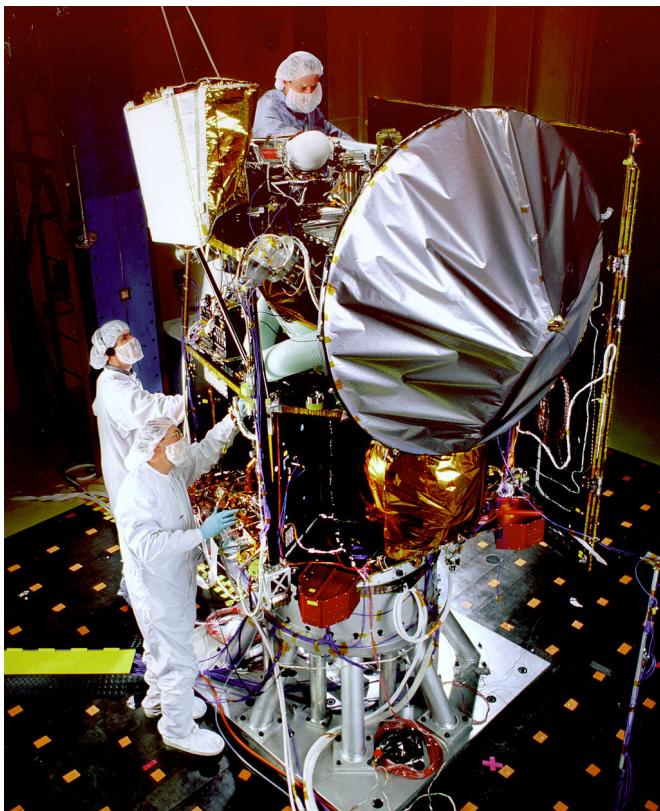
Forming teams



SOFTWARE ENGINEERING

"I SPEND A LOT OF TIME ON THIS TASK.
I SHOULD WRITE A PROGRAM AUTOMATING IT!"





The Making of a Fly: The Genetics of Animal Design (Paperback)
by Peter A. Lawrence

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Google

www.viktoria.se

COMPLEXITY

“The complexity of software is an essential property, not an accidental one.”

Fred Brooks

Continuous world → discrete system

Immateriality of software

Understanding problem domain

Managing development

SOFTWARE CRISIS

Projects running over-budget.

Projects running over-time.

Software was very inefficient.

Software was of low quality.

Software often did not meet requirements.

Projects were unmanageable and code difficult to maintain.

Software was never delivered.



SOFTWARE ENGINEERING

Application of engineering to software

Systematic & disciplined approach to the development and maintenance of software to assure quality of processes and products

THREE MAIN STEPS

Specify

- Problem and solution
- Customer expectations

Implement

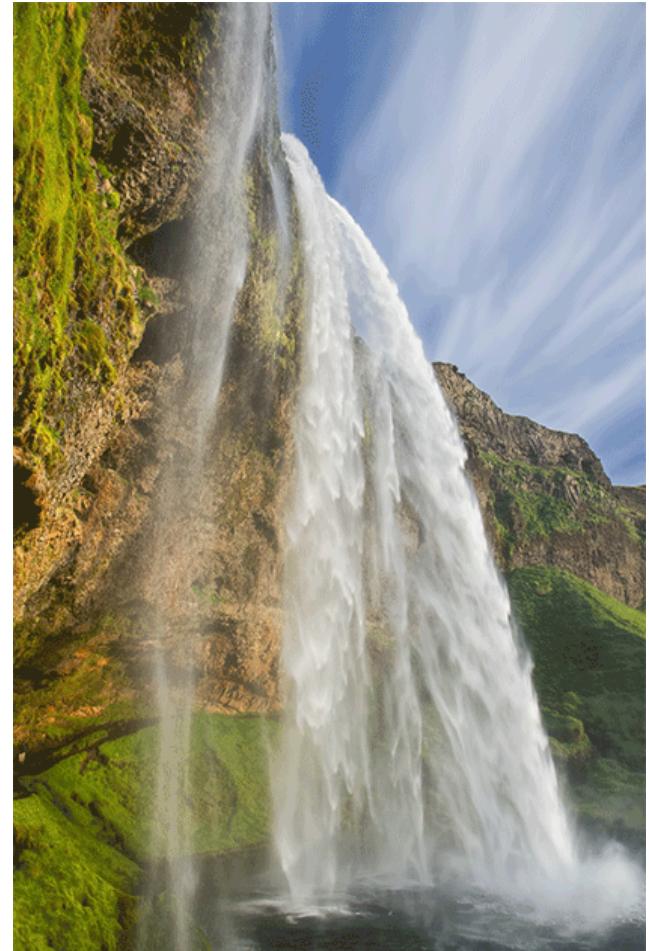
- Learn tools and technology
- Docs, configs, ...

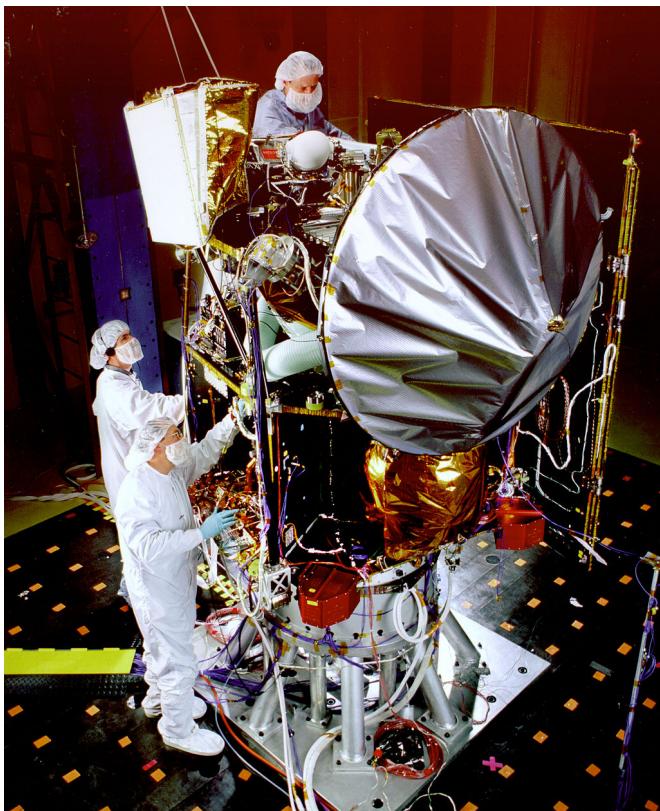
Test

- Ensure quality

Evolve

- Debug
- Refine





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Google

MLOC

- Simple app: 0.001
- Windows NT 3.1, 1993: 5
- Firefox: 10
- MS Office 2013: 40
- Facebook: 60
- Modern car: 100

PRODUCTION vs CREATION



PROCESSES

Defined process:

A process that repeatedly (re)produces acceptable quality output

Empirical process:

The complexity of intermediate activities makes the defined process unachievable

DEFINED PROCESS

Heavy on pre-study
Assumes static context
& good estimations
Long iterations
Top-down management

EMPIRICAL PROCESS

Change is a reality

Short iterations

Just enough management / self-organisation

Continuous planning

AGILE

Processes

- Kanban
- XP - eXtreme Programming
- Test-driven development
- Feature-driven development
- Scrum

Practices

- User stories
- (Cross-functional) Teams
- Stand-up meetings
- Short iterations
- Continuous testing
- Coding standards
- Sustainable pace
- Pair programming
- Customer value

SCRUM



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DAT255

<https://github.com/hburden/DAT255>

SOFTWARE ENGINEERING PROJECT

ELECTRICITY | INNOVATION CHALLENGE



Swedish

ElectriCity Innovation Challenge 2015

Participate in shaping tomorrow's bus trips
September - October 2015

www.viktoria.se

SWEDISH
ICT

VIKTORIA

PROJECT OVERVIEW

Innovation challenge

Real customer(s)

Real problem

Real platform

Real process

No supervisor(s)

Independence and responsibility

OVERALL STRUCTURE

Week 1-3

- Android, GitHub, Scrum, vision

- Mon & Wed 10-12

- Lectures, HC4

Week 4-8

- From vision to product

- Tue 10-12

- Technical support, 5205-15

Week 9

- Demonstration

Week 10

- Sign off

~ 20 h/week

IMPORTANT DATES

- September
 - 11: Sign up
 - 18-19: Workshop
 - 19: Vision (1PM)
 - 24, 28, 30:
Customer
workshops
- October
 - 14: Customer workshop
 - 14: Beta-demo
 - 20: Prototype (1PM)
 - 21: Presentation
 - 22: Prize ceremony
 - 30: Sign off (5PM)

LEARNING GOALS

Knowledge and understanding
Skills and abilities
Judgement and approach

KNOWLEDGE AND UNDERSTANDING

The student should be able to

- identify the complexities of software design and development
- describe the fundamentals of software engineering, such as stakeholders and requirements
- describe the difference between the Customer, the Solution, and the Endeavour as well as the different methods used for each

Course evaluation 2014:

“I'd rewrite it as 'Being able to efficiently adapt the codebase to customer requirement changes'.”

SKILLS AND ABILITIES

The student should be able to

- elicit requirements from and design a solution to a real-world problem
- plan and execute a small software development project in a team
- apply skills from programming courses and other relevant courses in a project-like environment
- learn new tools and APIs on his/her own

Course evaluation 2014:

“Are you kidding me? We had to not only organize the project ourselves, search for information through teachers, supervisors, volvo and the internet (of which only the last seemed to have any constructive answers). We also had had to learn how to make an app for android, from scratch.”

~ 20 h/week

JUDGEMENT AND APPROACH

The student should be able to

- reflect on the choice of software engineering methods used in the project

Course evaluation 2014:

“Scrum was introduce to late and therefor mine group had to change our way to work to late in the course.”

ASSESSMENT

Artifacts:

- Working app (APK)
- Developer documentation
- User manual
- Post-mortem report
- Personal evaluation

Team grade based on:

- 30% User experience
 - GUI, vision, usefulness
- 40% Implementation
 - Code, docs, tests
- 30% Development process
 - Post-mortem report
- Personal contribution +/-

USER EXPERIENCE

Personal opinion → Customer value
Shaky → Finished
Usable → User-friendly

IMPLEMENTATION

Jungle → Overview
Spaghetti → Structure
Should work → Tested
Easy → Challenging

DEVELOPMENT PROCESS

Text book → Own experience
Requested → Out-of-the-box
Polished → Honest

PERSONAL CONTRIBUTION

	Eva	Per	Li	Jay	Foo	
Eva	12	5	11	14	8	50
Per	14	14	5	10	7	50
Li	13	12	5	10	10	50
Jay	14	12	5	14	7	50
Foo	15	10	5	13	7	50
	68	51	31	61	39	

- Individually
- $\text{size}(\text{Team}) \times 10$
- $\text{range}(0, 50)$
- E-mail by Oct 30th
- Code contribution

SUMMARY

Software engineering DAT255 course

- Systematic management of complexity
- Deliver value
- Innovation challenge as project
- Teams of 5

THIS WEEK

Tuesday 10-12: Git & Android 5205-15

Wednesday 10-12: Project presentation HC4

<https://github.com/hburden/DAT255>

<http://challenge.goteborgelectricity.se>

Vision
Teams

QA

'Questions don't have to make sense, Vincent', said Miss Susan.

'But answers do'

Terry Pratchett
Thief of Time, 2001