

# Pictures at CSEE&T 2016

## Keynotes, Panels & Presentations

### Day 1, April 5

















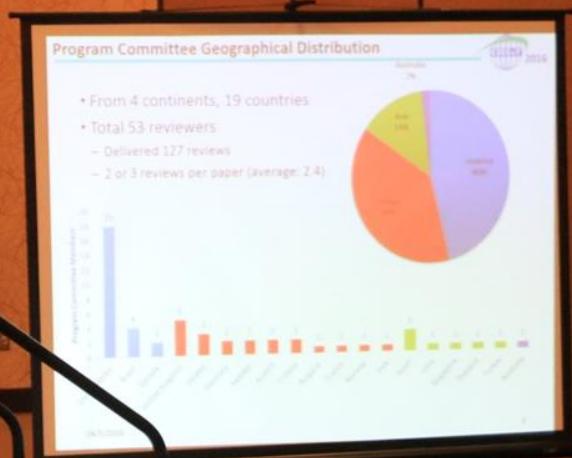
Thank you!

#### Program Committee

Shashikant Albal	Eduardo Almeida
Mark Ardis	Jocelyn Armarego
Mike Barker	Leonor Barroca
Ivana Boshic	David Budgen
Jeffrey Carver	Igor Cavrak
Paolo Ciancarini	Tayana Conte
Ivica Crnkovic	Laurence Duchien
Georgi Hagel	Regina Hebig
Sylvia Ilieva	Shaun Longstreet
Nancy Mead	Shin Nakajima
Rory O Connor	Juergen Mottok
Roshanak Roshandei	Chandan Rupakheti
Bonita Sharif	Mark Sherriff
Murali Sitaraman	Judith Stafford
Karrie Thompson	Steve Tockey
John Warwick	Jon Whittle
	Mikio Aoyama
	Ellen Barbosa
	Andreas Böllin
	Yuanfang Cai
	Wajee Chookittikul
	Tony Cowling
	Vahid Garousi
	Elke Hochmiller
	Tiziana Margaria
	Emily Navarr
	Damith Rajapaks
	Todd Sedano
	David Sinclair
	Anya Tafilovich
	Alf Inge Wang
	Michal Young



A woman in a grey blazer stands behind a dark wooden podium, speaking into a microphone. She has short dark hair and is wearing a lanyard.





EXIT

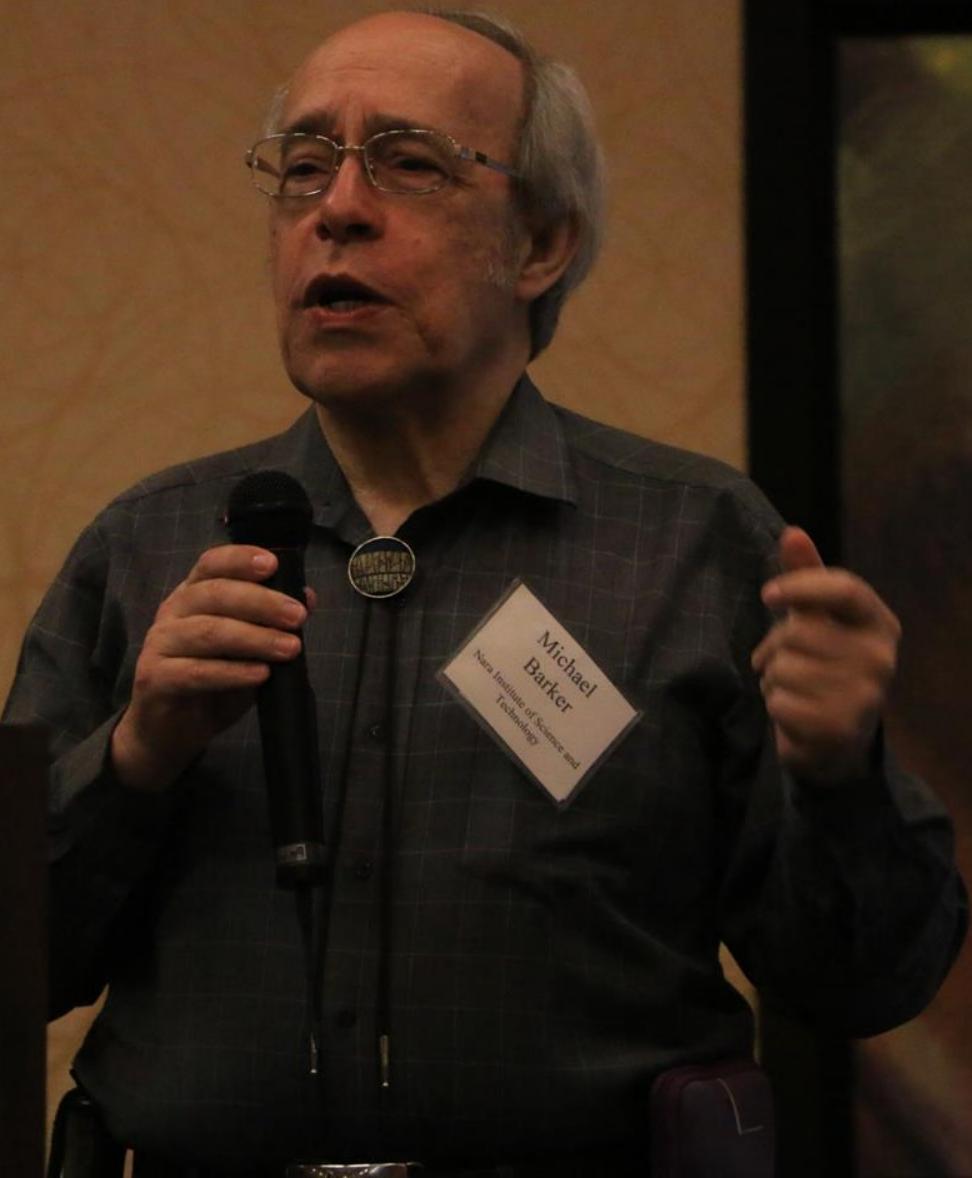
















Daniel  
Port





Anthony J. Lattanzio  
Director, Professional Software Engineering Programs  
Duquesne University, Pittsburgh, PA, USA





## CSEET 2016

Software Engineering Core  
in an Age of Specialization

Anthony J. Lattanzi  
Director, Professional Software Engineering Programs,  
Carnegie Mellon University, Pittsburgh PA, USA











#### ZWE Industrial Landscape (Circa 1989)

- The industrial landscape was very different all over the world.
- Industrial areas contained:
  - Factories and refineries for the steel and oil industries
  - Industrial zones containing many factories
  - Industrial zones containing many refineries
- The industrial landscape was very different all over the world.

### SWE Industrial Landscape (Circa 1989)

- The technological landscape was very different at the time our programs were created.
- Computer and monitor technology was not yet widespread.
- The first personal computers used 8 or 16 bit processors.
- The first computer mouse was a simple trackball.
- IBM was introducing laptop as a portable computing device.
- The first personal computer was not memory intensive and required much more time-consuming and expensive disk drives.
- The cost of the products was still very reasonable compared to what they are today.









Michael  
Barker  
Massachusetts Institute of Technology  
Faculty of Engineering

Murali





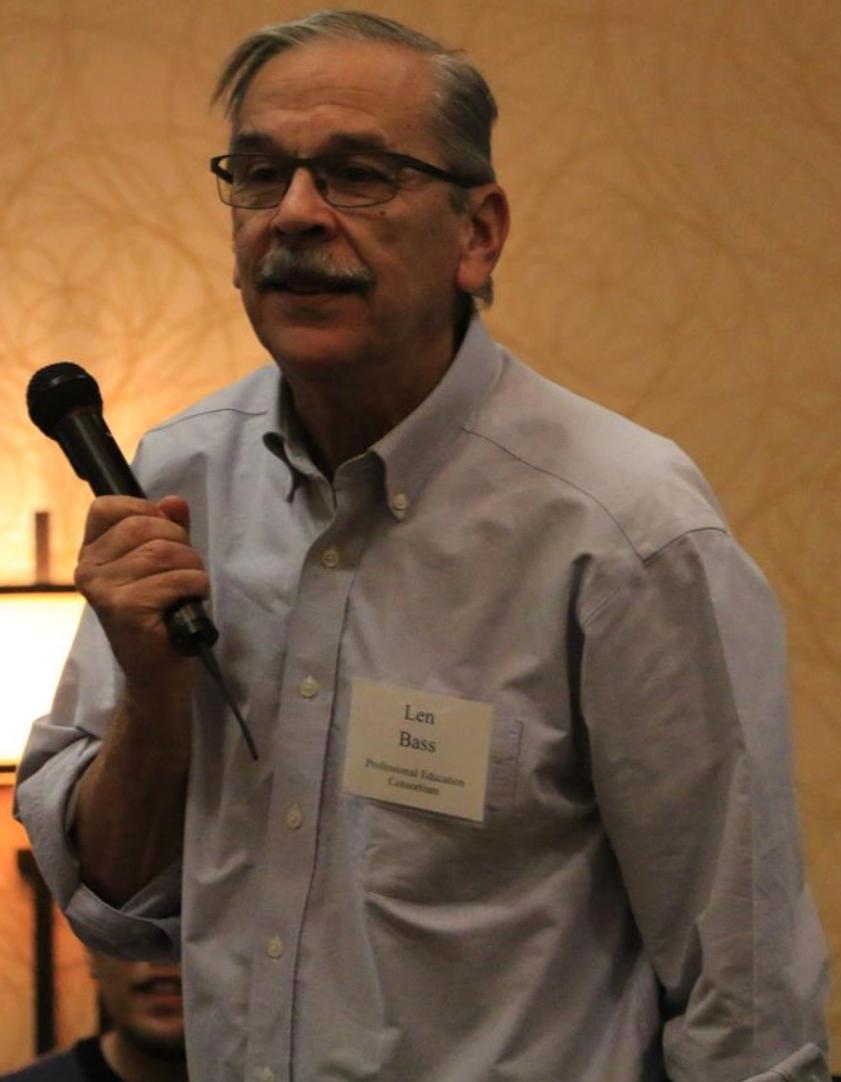












Len  
Bass

Professional Education  
Consortium











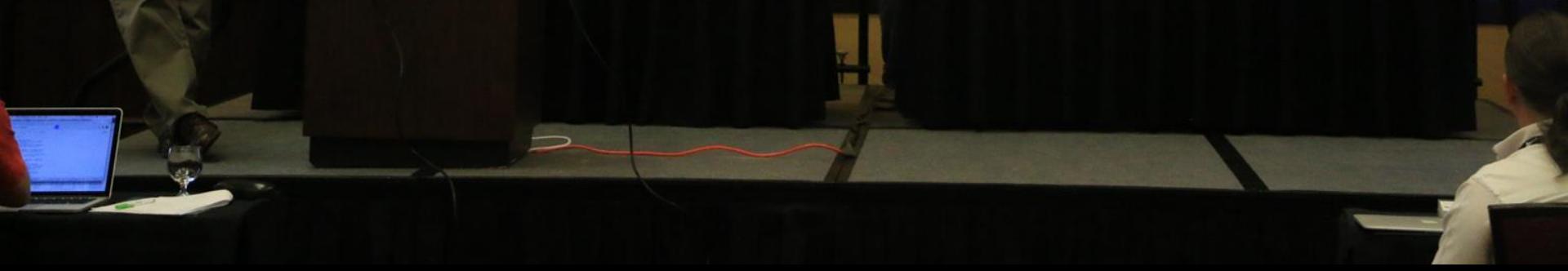


## Topics

- What would you consider most important about this material?
- What would the students need to do to understand this better?
- How can we teach this material and what supporting materials can we use?
- How relevant is the material and what does it connect to in your field of research?

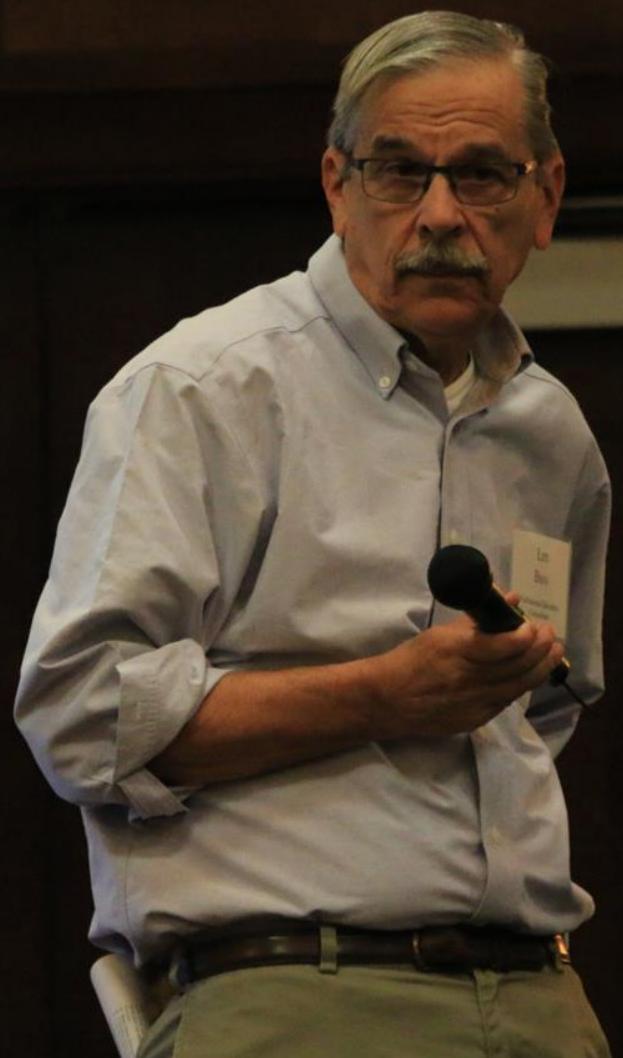
...more

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## Topics

- What is continuous delivery and what problem does it solve?
- What skills do the students need and what is the industry need for such skills?
- What do we teach in our courses and what supporting material do we use?
- How advanced is the material and what level of students should be taught this material?

















Andreas  
Meier

French Ministry of Higher  
Education DRAW





Contin  
Break  
for CSE  
Confere









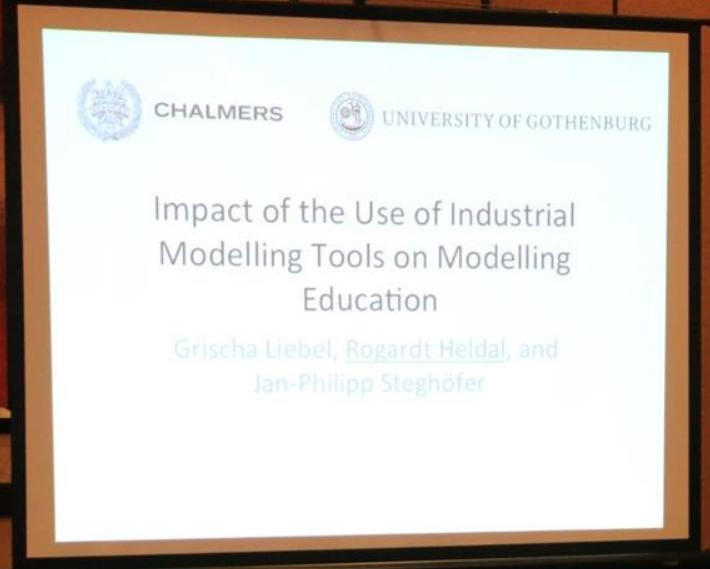
CHALMERS



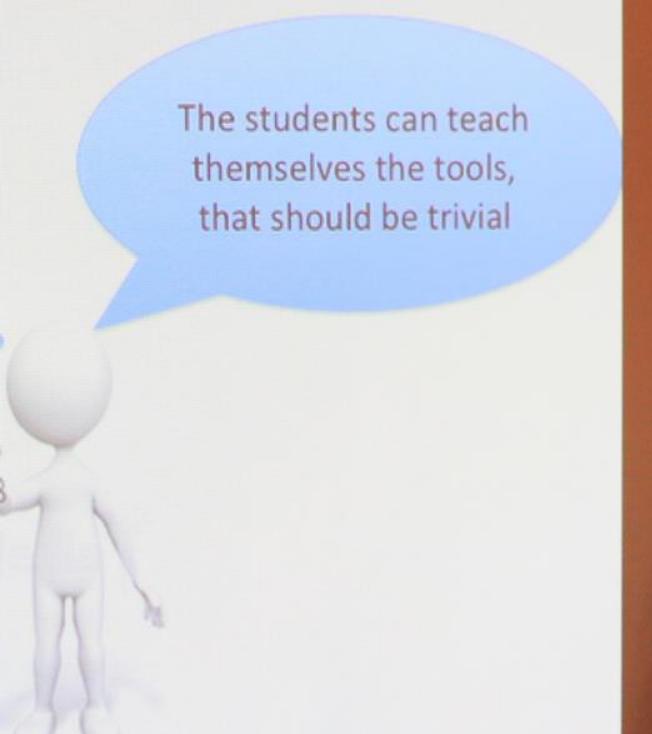
UNIVERSITY OF GOTHENBURG

## Impact of the Use of Industrial Modelling Tools on Modelling Education

Grischa Liebel, [Rogardt Heldal](#), and  
Jan-Philipp Steghöfer



# or tools?



The students can teach  
themselves the tools,  
that should be trivial



Teach the ideas!



Want to teach the ideas:



Do not want to teach the tools:





## Student Backgrounds

- For the Masters of Software Engineering (MSE) program students must have...
  - two or more years of industrial software development experience
  - basic CS and mathematics background
- For the MSIT and ESE programs must have
  - 1 or more industrial internships
  - team project experience
  - basic CS and mathematics background and reasonable grades/GPA.

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## expert role (Papyrus)

questions from students  
the tool, at least within 24 hours.

to meet the tool expert face to  
faces a week.

ture on the tool





## Much Direction – 3

- Directed process framework:
  - specified that all teams use Team Software Process (TSP) - training provided by the SEI
  - provided structure and consistency
- Strengths and weaknesses:
  - Students did not think, did not practice judgment in how to select, instantiate, and tailor processes
    - after a time, teams merely went “through the motions” – *do something to make mentors happy*
    - if teams are bent on hacking, they will hack... issuing a fixed process framework won’t help

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Meeting Industry Needs

Return on Investment

Conclusions and Lessons Learned





until recently

Software Engin



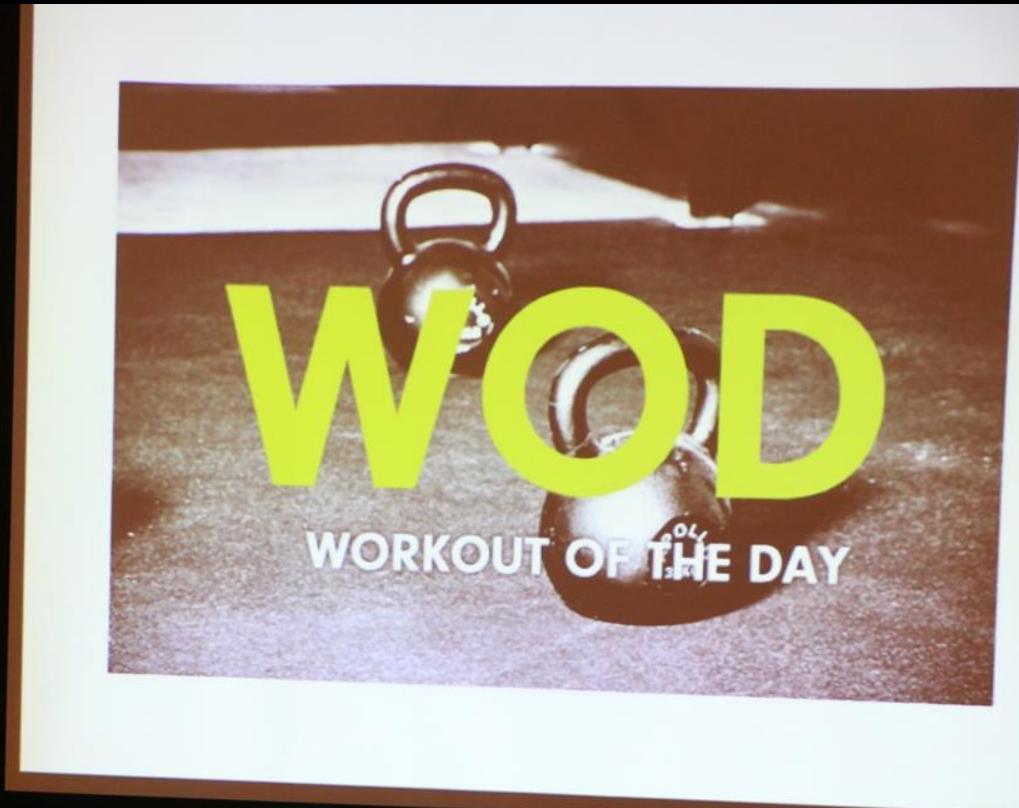
Green  
marker



# WHAT IS CROSSFIT?

And what does it have to do with SE Ed?





## Timeline for the Community College and Industry Apprenticeship Program



## Timeline for the Community College and Industry Apprenticeship Program





Girish  
Seshagiri

John Information  
Technology Inc.



The image shows a man in a dark suit and tie standing on a stage, pointing his right arm towards a large screen. He is wearing glasses and has a name tag around his neck. The screen displays a software interface with a sidebar labeled 'TEACHING' and several tabs at the top. The main area shows a list of items under 'PROVED' and some code-like text below it. The background is a warm-toned wall.

TEACHING

SEARCH | Components | Import | Export

PROVED

NCL 1.06

NCL 2.06

NCL 3.06

NCL 4.06

NCL 5.06

NCL 6.06

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NCL 100.06

This content is funded as part of NIST's plan of activities. Disclosure of this content does not imply endorsement by NIST.



## Tool Assisted Loop Invariant Development and Analysis

Caleb Priester, Yu-Shan Sun, and Murali Sitaraman  
RESOLVE Software Research Group (RSRG)  
Clemson University  
<http://www.cs.clemson.edu/resolve>



Funded in part by NSF grants CCF-1161916 and DUE-1022941.





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 **Forming Teams is Hard with Distance Education**



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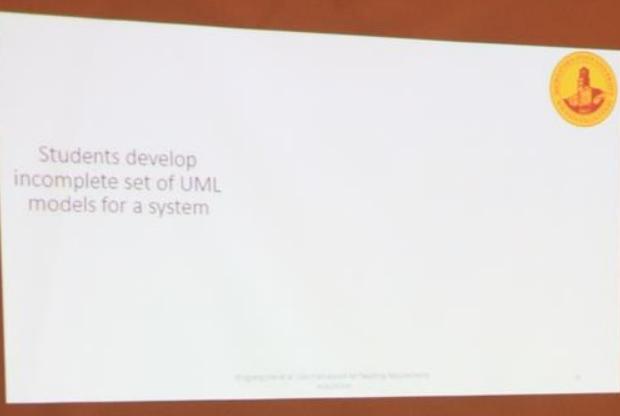


## Early Atte

- Research papers
  - too theoretical
- Manage hypothetical teams
  - too clumsy and inconsistent
- Remote teaming
  - too many students could not synchronize their schedules
  - most have “real jobs”







## Introduction

Project Management (PM) is an important area of SE education.

It is a critical area for many software organizations

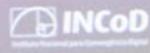
Currently, a significant amount of software projects still fail!

- The absence of a PM process is pointed out as one of main causes.

Lack of proper PM process

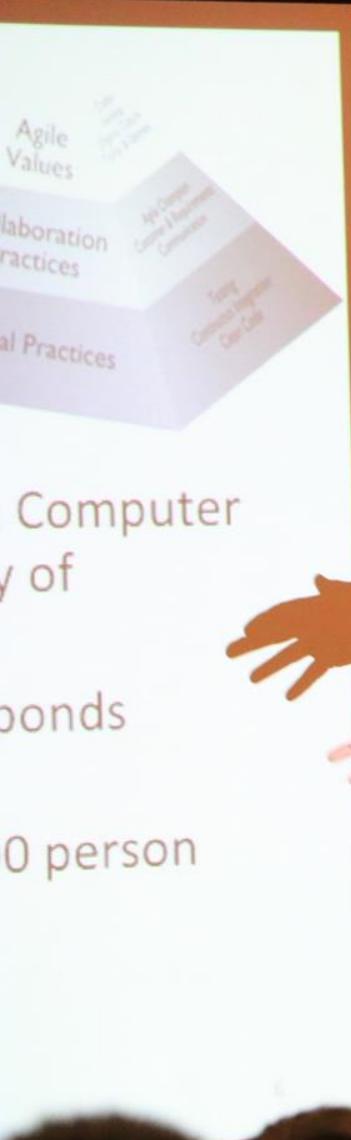
Leads to

- Unaccomplished deadlines
- Budget overrun
- Incomplete scope coverage



Rafael Queiroz Goncalves, M.Sc  
Chair, Dr. Christiane Guen-Warghem, PMP







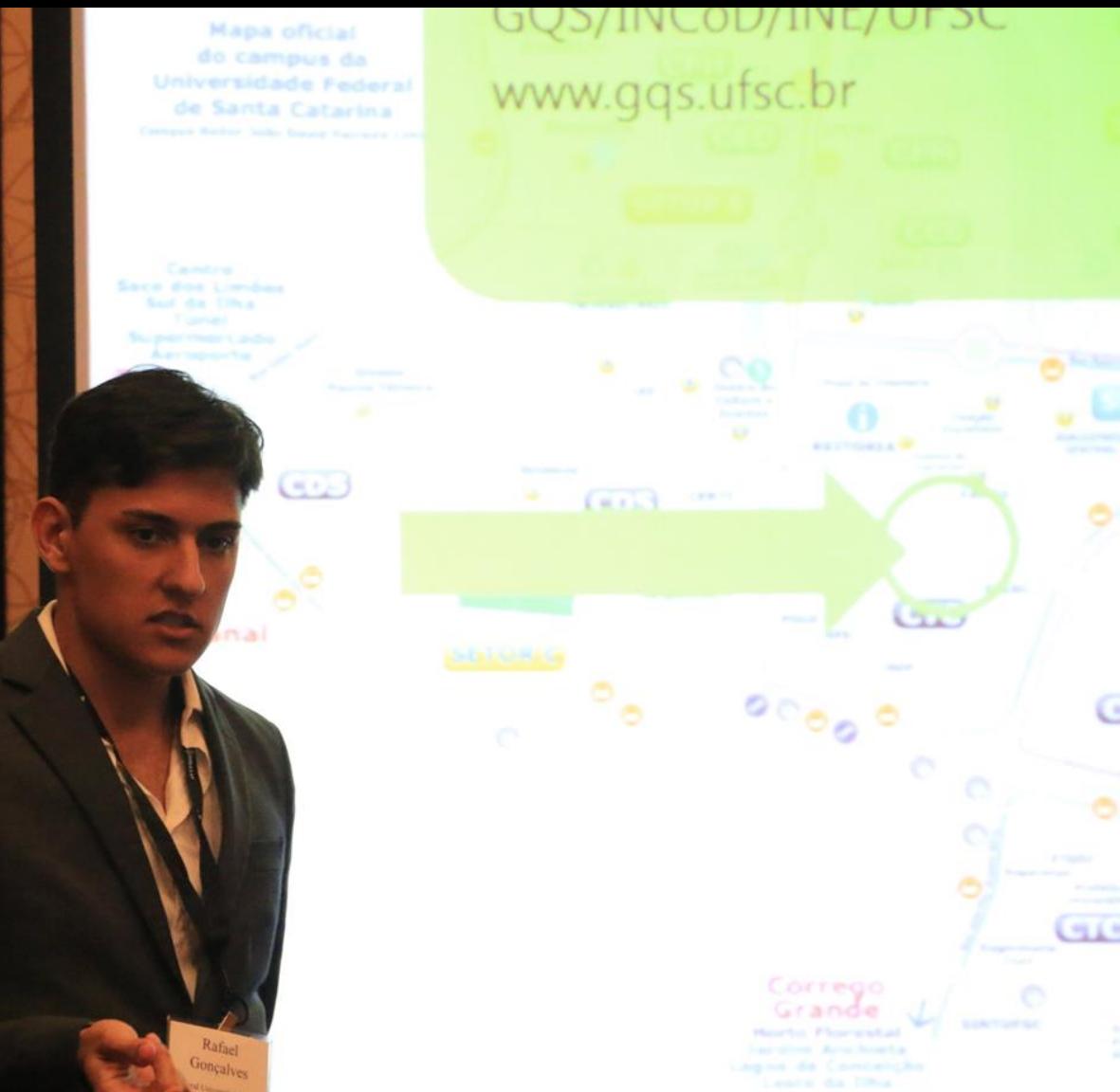
## Outline- Importance of Object Oriented Programming

- Object Oriented Programming is based on the concept of objects and class.

Advantages:

- Objects in OOP can be reused in various program.
- OOP is easier to program and maintain than non-object oriented programming.
- Many real time applications including mobile application can be developed using OOP.
- Many advanced computer science courses are included in curriculum which requires lot of computation problems to be solved using OOP.
- Studies have shown OOP improves the problem solving and analytical skill of students.



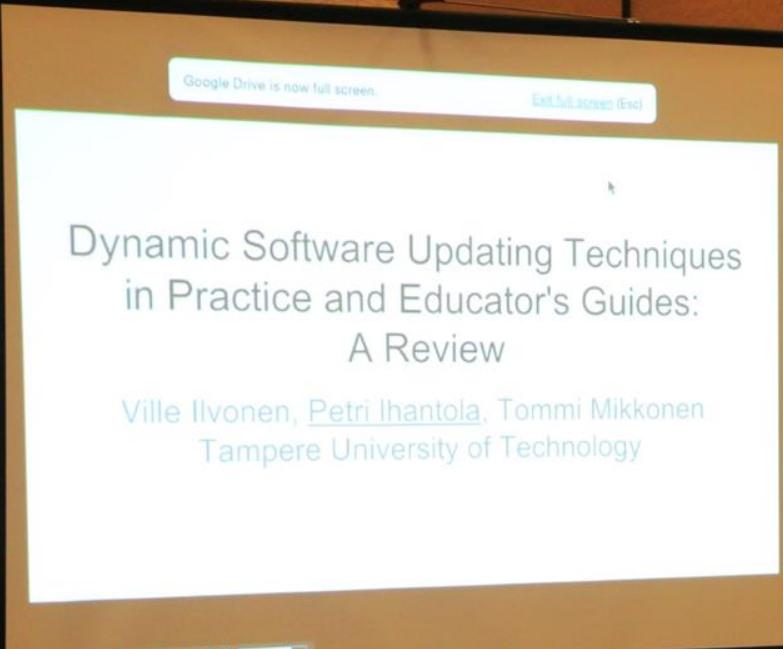






- 
- Fundamentals of Measurement (GQM)
  - Data Analysis for the Statistically Challenged (central tendency, variability, measurement error, SD)
  - Measuring Size (Lines of code, function points, shall, use case points)
  - Complexity (size, cyclomatic complexity, Halstead's metrics, information flow metrics, maintainability index, object-oriented metrics)
  - Function Points and Gearing Factors (IFPUG, COSMIC)
  - Estimating Effort (Delphi, using benchmarks, analogy, algorithmic models)
  - Agile Estimation, Custom Models, and Tools (story points, planning poker)
  - Duration (Putnam-Norden-Rayleigh curve, Models based on the QSM & ISBSG datasets, team size)
  - Dynamic Defect Models (Rayleigh model)
  - Static Defect Models (COQUALMO)
  - Measuring and Predicting Reliability (reliability function, mean time between failure, operational profiles)
  - Performability and Presentability (Dashboard, Data Viz)
  - In-Process Metrics (Defect discovery rate, code turnover rate)







## Dynamic Software Updating Techniques in Practice and Educator's Guides: A Review

Ville Ilvonen, Petri Ihantola, Tommi Mikkonen  
Tampere University of Technology













## THE SWE BACHELOR OF ENGINEERING PROGRAM

- First US SWE program also has an ABET accredited general engineering curriculum.
- Students prepared to sit for the Fundamentals of Engineering (FE) examination
- Curriculum: 141 Credit Hours
  - Part of Stevens Undergraduate Engineering
  - 9 SwE Courses, +2 Senior Design
    - Includes Systems Engineering
- CO-OP: Highly Recommended
- Culture: Small, Personal Program
- Fall 2015: 18 Fresh, 5 Soph, 1 Jr



US SWE program also has an ABET accredited general engineering curriculum.

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Includes Systems Engineering

HOP: Highly Recommended

Structure: Small, Personal Program

12015; 18 Frosh, 5 Soph, 1 Jr





## Root Cause: Lack of an OOAD Methodology

- A lot of effort and \$\$\$ have been spent on process.
- In my opinion (definition), a process specifies when to do what, but not how to do them.
- A methodology details the phases of a process. It specifies HOW-TO perform the phased activities of a process.

Conventional and agile projects require a process  
Lack of methodology.

Object-Oriented Software  
Unified Methodology," McGraw-



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Personality plays a important  
role for team/individual  
learning effectiveness in  
controlled PBL  
[CSEE&T'13][CSEE&T'14][TETC'16]

Team Characteristics for Maximizing the Educational Effectiveness of Practical Lectures on Software Intensive Systems Development, CSEE&T 2013  
The Impacts of Personal Characteristic on Educational Effectiveness in Controlled-Project Based Learning on Software Systems Development, CSEE&T 2014  
Relation between Combinations of Personal Characteristics, Times and Educational Effectiveness for a Controlled Project-Based Learning Course, IEEE Trans. Emerging Topics in Comput., 2016





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Carnegie Mellon University  
Silicon Valley

## Code Readability Testing, an Empirical Study

Presenter  
Todd Sedano

SV.CMU.EDU



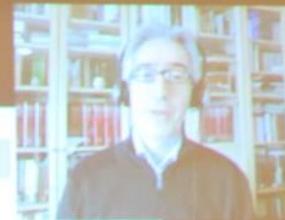


Todd  
Sedano

Carnegie Mellon University

## Data Collection





### (I) Motivation (1/3)

- Software systems are getting to new dimensions
  - Voyager ... 3 KLOC (1977),





EXIT

n|w University of Applied Sciences and Arts  
Northwestern Switzerland

# Teaching Agile Collaboration Skills in the Classroom

Martin Kropp, University of Applied Sciences  
Northwestern Switzerland

Andreas Meier, Zurich University of Applied Sciences  
Switzerland

Robert Biddle, Carleton University  
Canada



A medium shot of a man from the chest up. He is wearing a dark suit jacket over a light-colored button-down shirt and a dark tie with a subtle floral or leaf pattern. A name tag is pinned to his left lapel, which reads "Robert Biddle" and "Carleton University". He is looking slightly to his left with a neutral to slightly smiling expression. The background is dark, and to his left is a vertical panel with a light-colored, organic, branching or root-like texture. To his right, a portion of a door frame and handle are visible.

Robert  
Biddle  
Carleton University