QRS 2017
Photo Album
07/28


Engineering Fine-Grained Dependability Requirements
An Environment Modeling based Approach
Zhi Jin
An Environment Modeling based Approach
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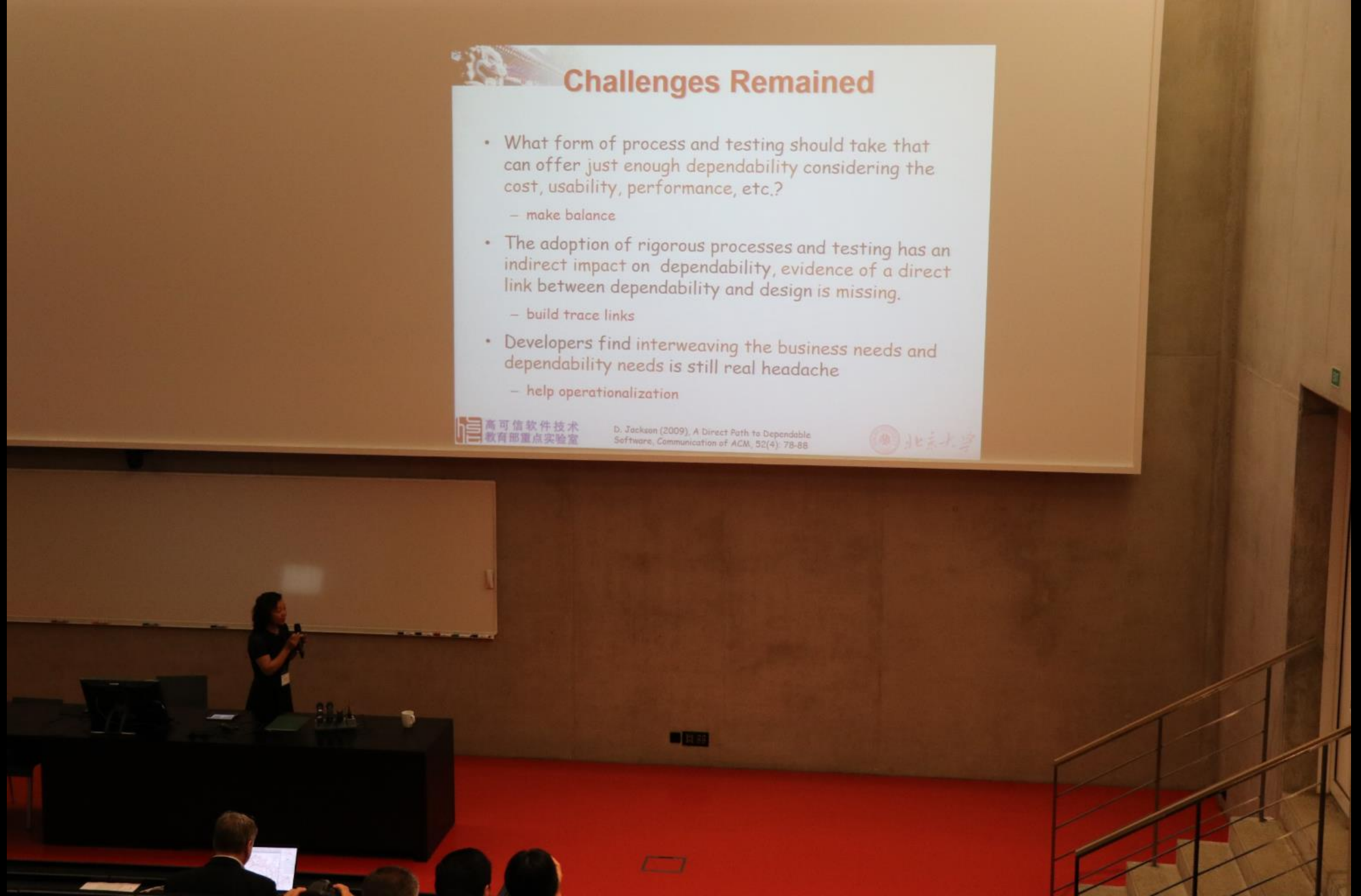
QRS, 2017.07.28, Prague, Czech Republic
北京大学


Motivation: Trend in Computing
As tool of the information processing, software needs only to meet the predefined specification
Traditional Application Scenario
Software: be in charge of information processing
New Application Scenario
Software: be carrier of application values
As a carrier of application values, software needs to deal with the open and dynamic environment, continuously meet the diverse and varied needs of users
Motivation: Trend in Computing
As tool of the information processing, software needs only to meet the predefined specification
Traditional Application Scenario
Software: be in charge of information processing
New Application Scenario
Software: be carrier of application values


Challenges Remained
What form of process and testing should take that can offer just enough dependability considering the cost, usability, performance, etc.?
make balance
The adoption of rigorous processes and testing has an indirect impact on dependability, evidence of a direct link between dependability and design is missing.
build trace links
Developers find interweaving the business needs and dependability needs is still real headache
help operationalization
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D. Jackson (2009). A Direct Path to Dependable Software. Communication of ACM, 52(4): 78-88


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What is Dependability
The notion of dependability, defined as the trustworthiness of a computing system which allows reliance to be justifiably placed on the service it delivers, enables these various concerns to be subsumed within a single conceptual framework.


IEEE
ReliabilitySociety
QRS 2017
The 2017 IEEE International Conference on
Software Quality, Reliability & Security
July 25-29, 2017 • Prague, Czech Republic
http://paris.utdallas.edu/qrs17


Improving MC/DC and Fault Detection Strength Using Combinatorial Testing
Dong Li, Linghuan Hu, Ruizhi Gao
W. Eric Wong, D. Richard Kuhn , Raghu N. Kacker

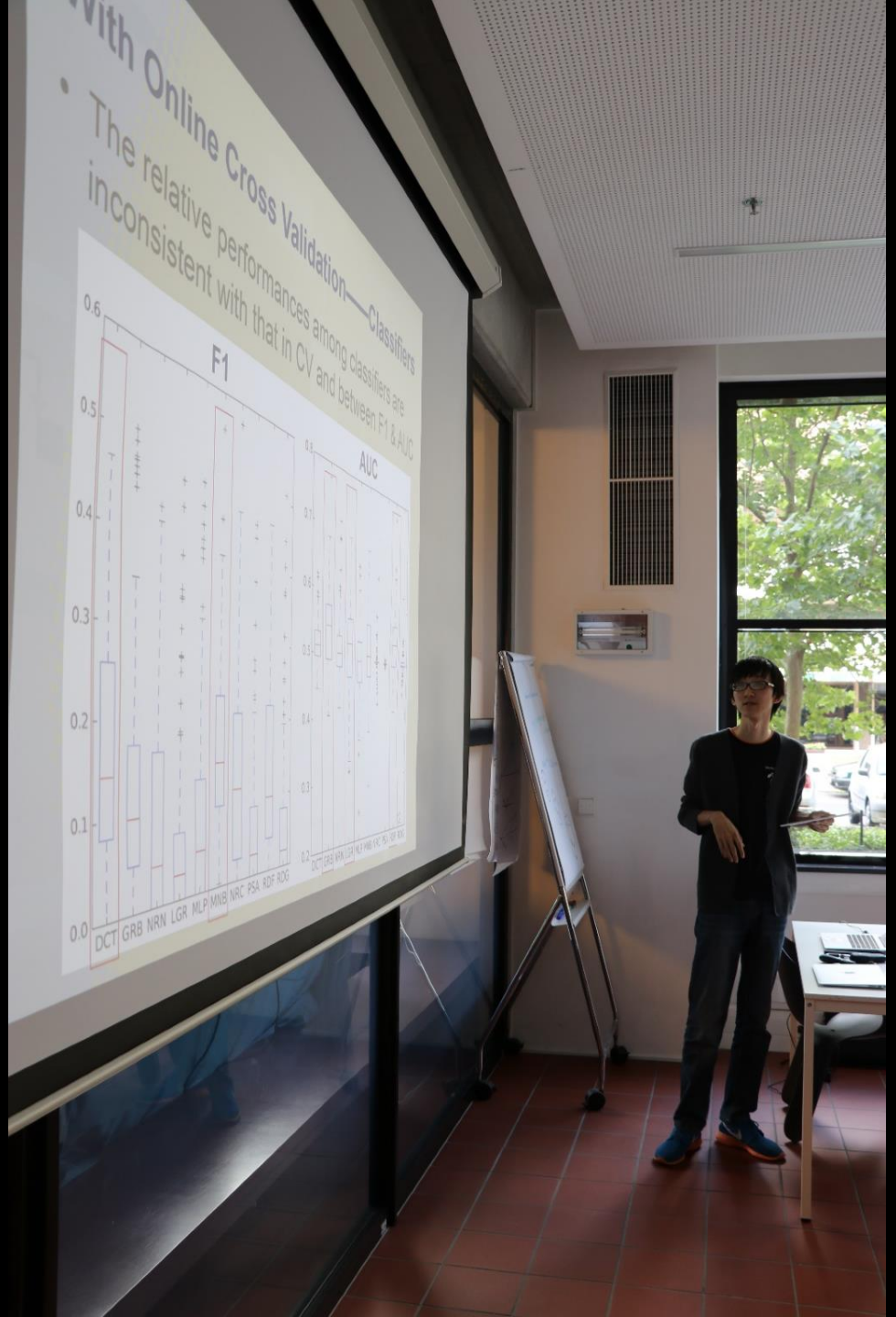

Combinatorial Testing

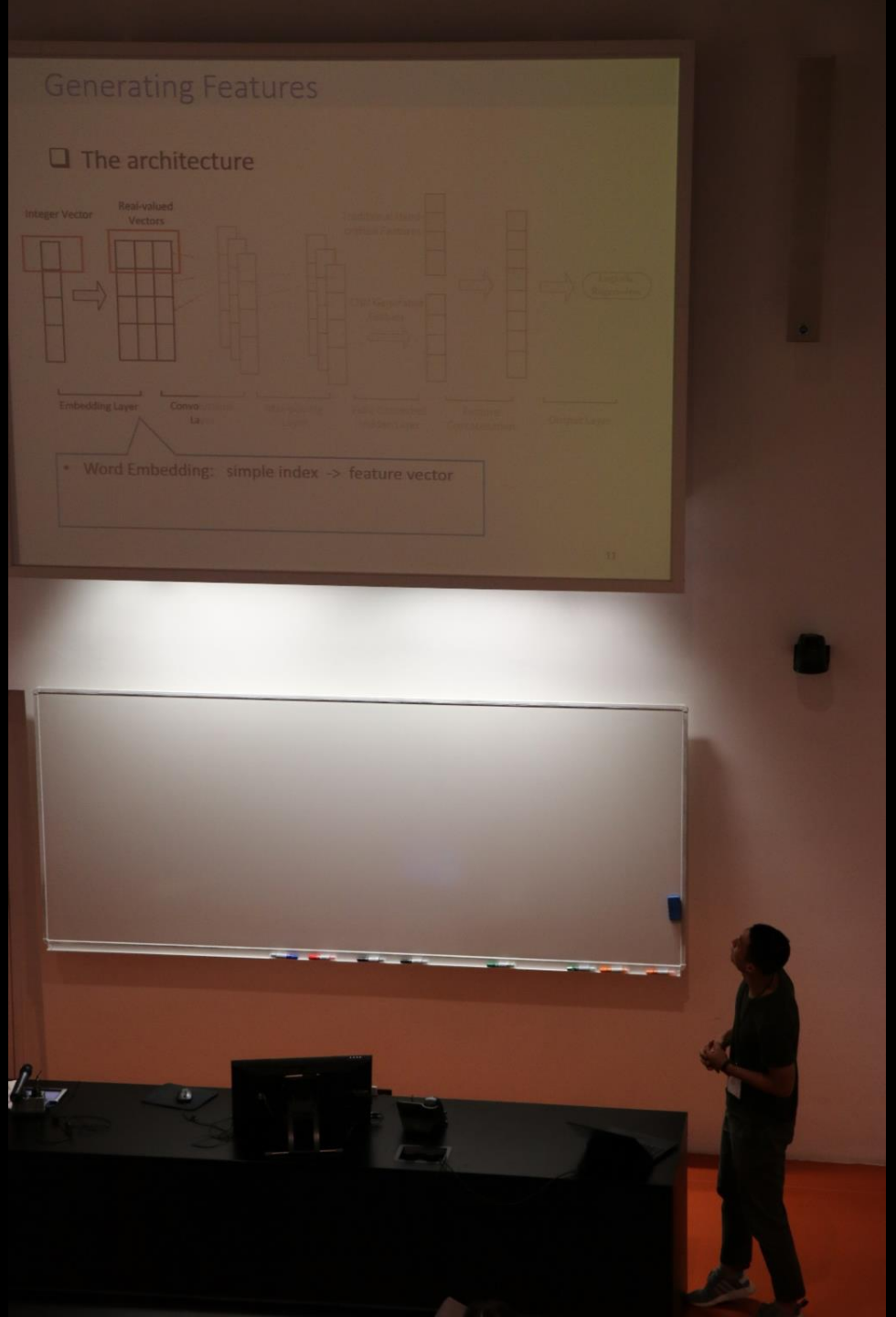

Reebok

Variation of SaaS Delivery Model

- *Single software instance mode*
  - All clients use a single software instance using same work flow and code on the same infrastructure.
  - This is the most restricted pattern of SaaS
- *Single customizable software instance*
  - All clients use the same code but the instance is customizable
  - This is the most difficult use pattern.
  - A SaaS application serving numerous clients may have hundreds, even thousands customization points with each of them providing multiple options
- *Single software instance for single client*
  - This is the most flexible mode
  - Each client can customize its code instance without affecting other clients
  - This mode does not retain the characteristics of SaaS, rather the model becomes a PaaS (Platform-as-a- Service).

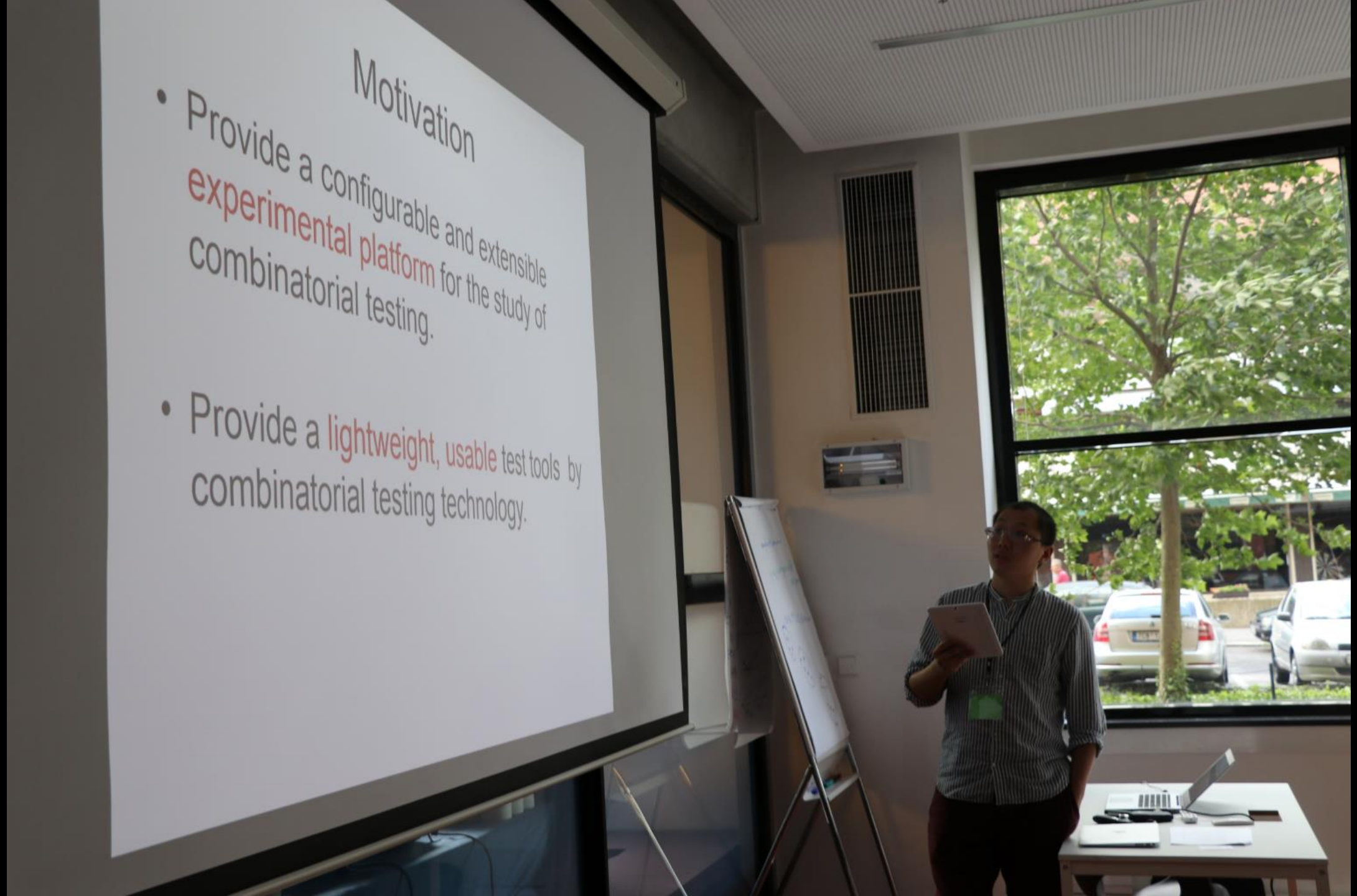

Trace analysis
Users can play recorded program executions.
Available in trace mode (disharmony maps).
Trace recorded by Eclipse plugin inTrace.
Each method invocation:
highlights respective floor,
colorizes the floor per chosen color,
increases the opacity of building.
Could be used to identify fragments related to certain feature, to determine test coverage or for profiling.


With Online Cross Validation——Classifiers
The relative performances among classifiers are inconsistent with that in CV and between F1 & AUC
F1
AUC
0.6
0.5
0.4
0.3
0.2
0.1
0.0
DCT GRB NRN LGR MLP MNB NRC PSA RDF RDG


Generating Features
The architecture
Integer Vector
Real-valued Vectors
Embedding Layer
Word Embedding: simple index -> feature vector


ASML
Assessing the Quality of Tabular State Machines through Metrics
Ammar Osaiweran, Jelena Marincic and Jan-Friso Groote
28-07-2017 Prague


Vehicle Level
Analysis Level
Design Level
Implementation Level
Features
of the vehicle
Abstract
functions
Hardware topology,
concrete functions,
allocation to nodes
Software Architecture
as represented
by AUTOSAR


Motivation
• Provide a configurable and extensible experimental platform for the study of combinatorial testing.
• Provide a lightweight, usable test tools by combinatorial testing technology.


Observed Equipment Failures in Terms of Device Ages:
Age t | Age at Least t | In the Study | Devices at Risk | Failed Devices | Censored L | Censored R
0 | 70 | 40 | 40 | 0 | 2 | 0
1 | 70 | 40 | 40 | 4 | 2 | 0
2 | 64 | 40 | 36 | 5 | 4 | 7
3 | 57 | 30 | 24 | 8 | 2 | 12
4 | 38 | 10 | 4 | 1 | 3 | 3
5 | 23 | 0 | 0 | 0 | 0 | 17
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EXIT


Investigating the Significance of Bellwether Effect to improve Software Effort Estimation
By
Solomon Mensah[1], Jacky Keung[1], Stephen MacDonell[2], Michael Bosu[3] & Kwabena Bennin [1]
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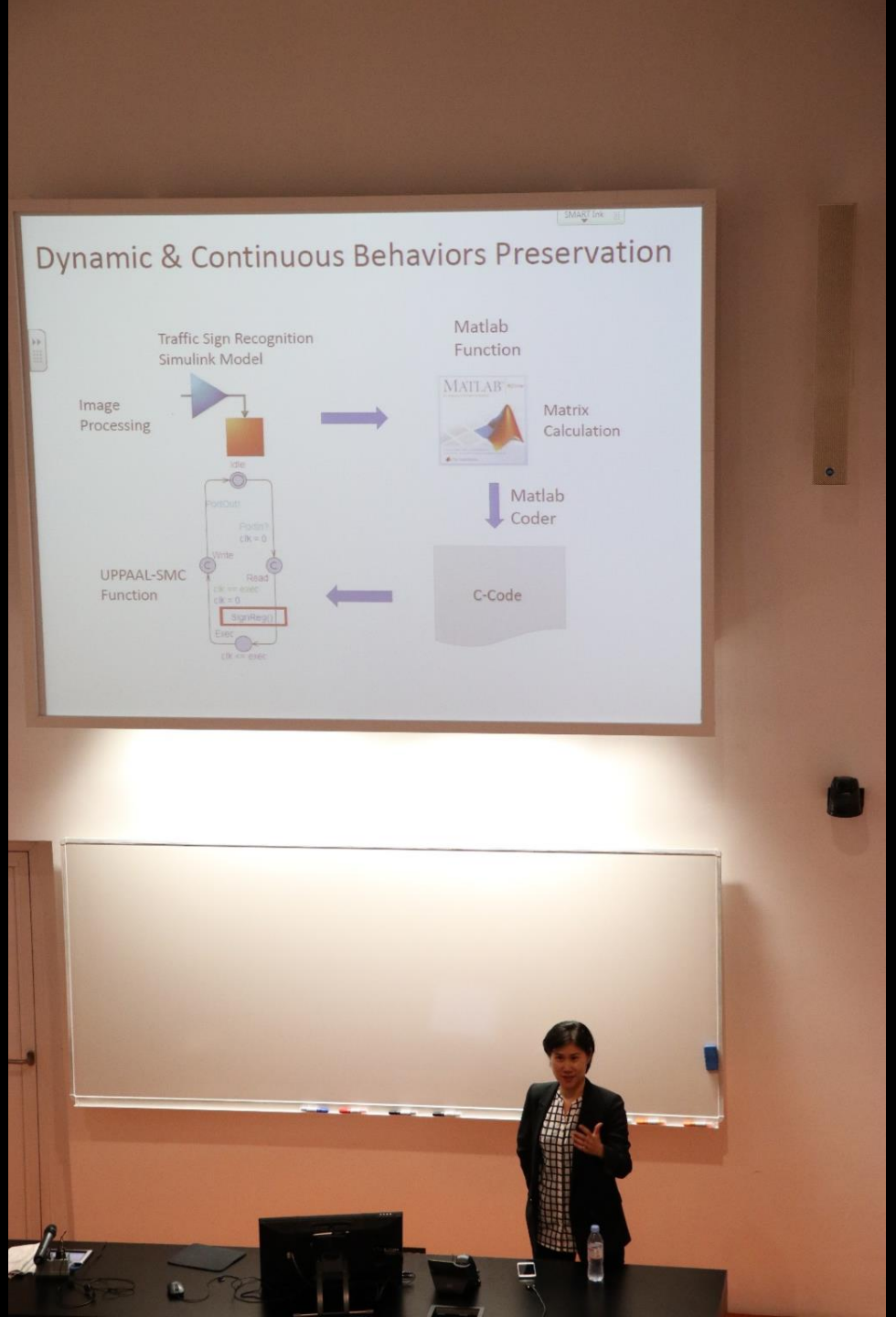
[2]University of Otago, New Zealand
[3]Centre for Business, Information Technology and Enterprise, New Zealand
July, 2017
CityU
Department of Computer Science
EXIT


Motorized Valve

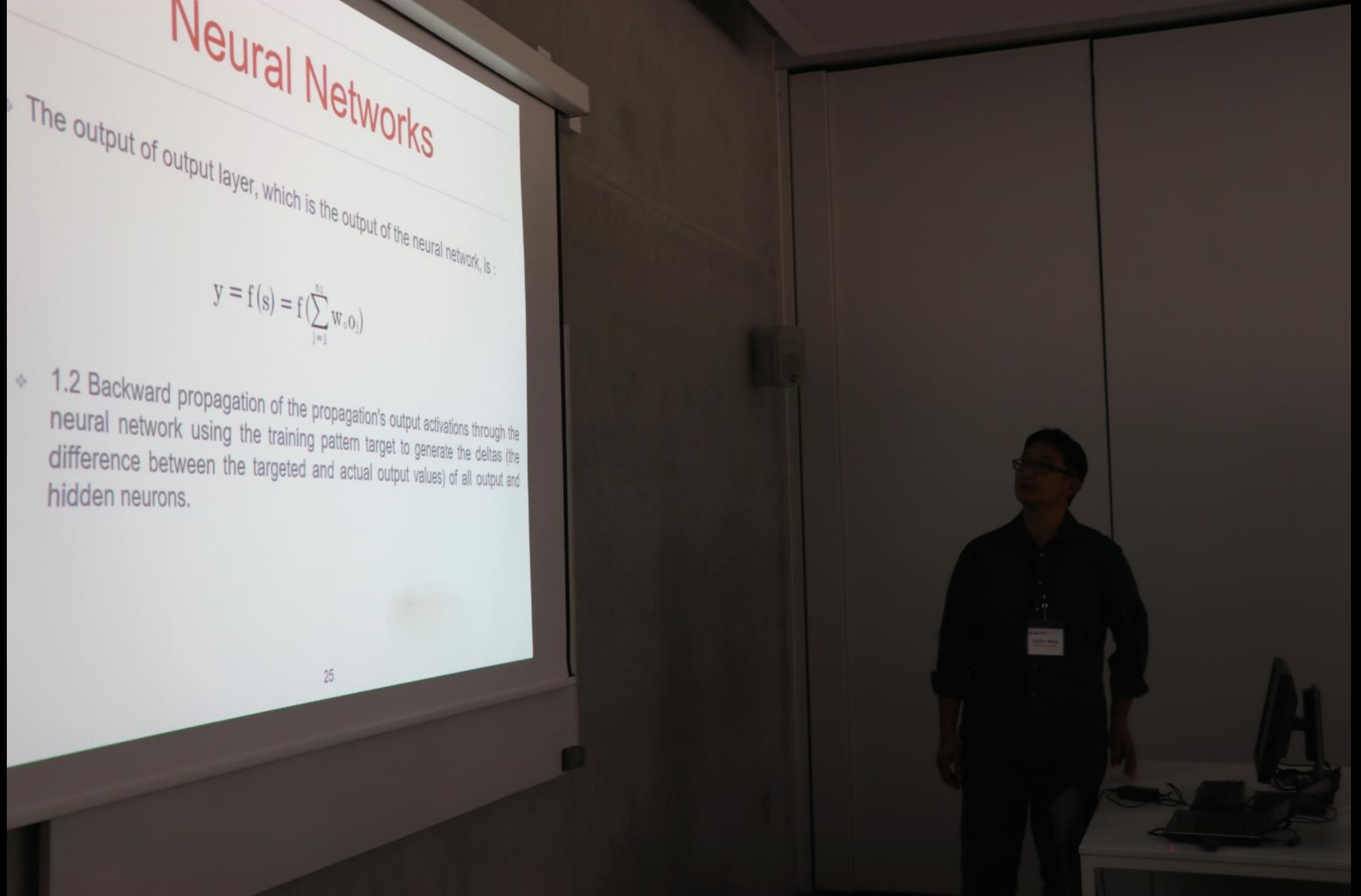

Conclusion (2/3)
• We made two big discoveries by data analysis.
• One is the difference in evaluation of research environment between students and teachers. The students did not appreciate the research environment as much as the teachers thought.
• The other finding is the difference in the self-evaluation of research ability between female students and male students. Female students evaluated their research abilities considerably low compared to male students.
• Considering these two facts, we set the following as future important themes.
• One is to develop a method of co-creation of values by students and teachers as-of the service of research environment, and
• The other is to develop a method to adjust the differences of self-assessment between female and male students in future surveys.


Part Two Emergency Travel Plan Generation Process
Information Formulation Process
Input Original Travel Information
Validation
Pre-Set Up Permitted Fluctuation Range
Monitoring
1. Record Original Travel Information
2. Formulate travel factors' permitted fluctuation range


Dynamic & Continuous Behaviors Preservation
Traffic Sign Recognition
Simulink Model
Image
Processing
Matlab
Function
Matrix
Calculation
Matlab
Coder
C-Code
UPPAAL-SMC
Function


NeCTAR
CSRack
Commercial
RMIT Adv. Manuf. Lab
RMIT VXLab
Industry Partner Lab
University Partner Lab


QRS 2017
Yichen Wang
Beihang University


Neural Networks
The output of output layer, which is the output of the neural network, is :
$$y = f(s) = f(\sum_{j=1}^{n1} w_o o_j)$$
1.2 Backward propagation of the propagation's output activations through the neural network using the training pattern target to generate the deltas (the difference between the targeted and actual output values) of all output and hidden neurons.
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