



Software Center

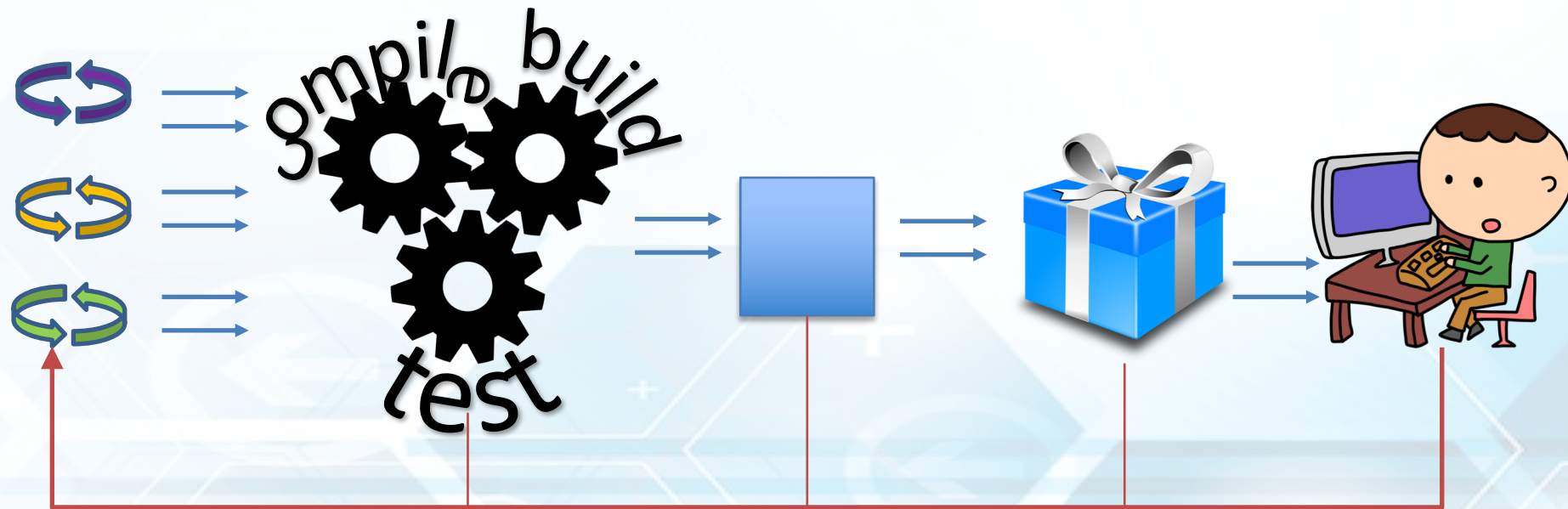
Theme #1

Continuous Delivery

Kristian Sandahl

Reporting workshop 2019-12-05

The machinery



Project #18 Visualization of Continuous Integration

Sprint 17:

- Strong visibility at the Eiffel summits
- Large investigation in the needs for visualization support

Researchers:

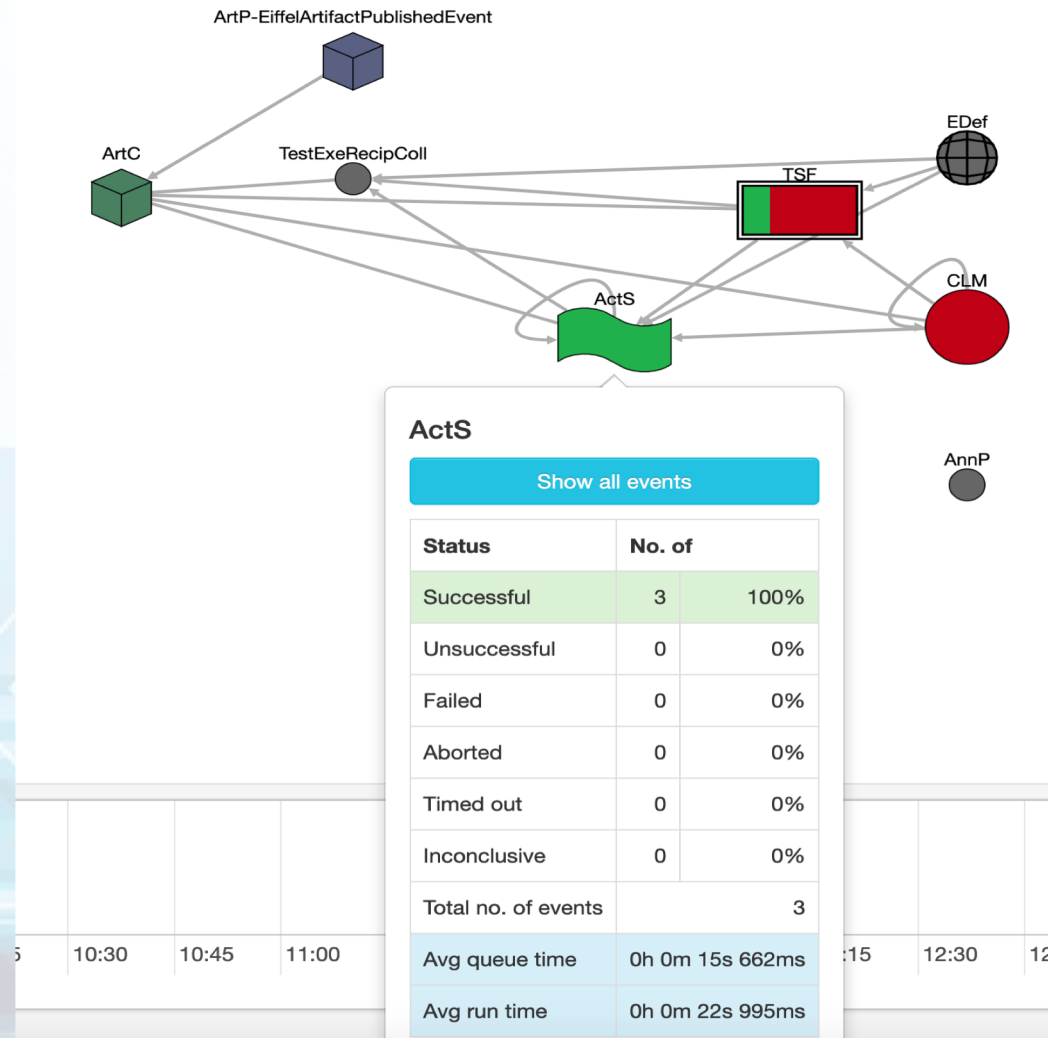
Kristian Sandahl

Ola Leifler

Azeem Ahmad

Ola Söder

Angelos Papangelis, et al.

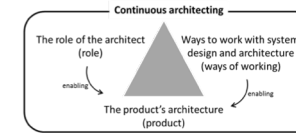


Enterprise Scale Continuous Integration and Delivery

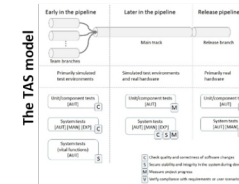
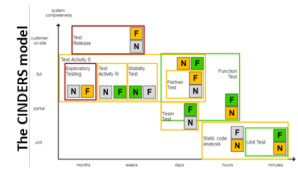
Enable more frequent integration of software

The EMFS model

Activity planning and execution	Confidence	Test
Work breakdown	0.1 - 0.4	0.1 - 0.4
Tasks and responsibilities	0.5 - 0.8	0.5 - 0.8
Activity sequencing	0.9 - 1.0	0.9 - 1.0
Activity enabling	0.1 - 0.4	0.1 - 0.4
Architect and security enabled architecture	0.5 - 0.8	0.5 - 0.8
Signoff	0.9 - 1.0	0.9 - 1.0
Tools and processes that are fast and simple	0.1 - 0.4	0.1 - 0.4
Availability of test environments	0.5 - 0.8	0.5 - 0.8
Test selection	0.9 - 1.0	0.9 - 1.0
Test feedback from the integration pipeline	0.1 - 0.4	0.1 - 0.4
Confidence through test activities	0.5 - 0.8	0.5 - 0.8
Test before commit	0.9 - 1.0	0.9 - 1.0
Regression tests in the pipeline	0.1 - 0.4	0.1 - 0.4
Reliability of test environments	0.5 - 0.8	0.5 - 0.8



Design the CI/CD pipeline



Exploratory testing in the CI/CD pipeline

The tester's knowledge, experience and personality

- 1. The tester's knowledge, experience and personality
- 2. The tester's knowledge, experience and personality
- 3. The tester's knowledge, experience and personality
- 4. The tester's knowledge, experience and personality
- 5. The tester's knowledge, experience and personality
- 6. The tester's knowledge, experience and personality
- 7. The tester's knowledge, experience and personality
- 8. The tester's knowledge, experience and personality
- 9. The tester's knowledge, experience and personality
- 10. The tester's knowledge, experience and personality



- **Presentation on exploratory testing this afternoon:**
 - The role of **exploratory testing** in the CI/CD pipeline?
 - Results from validation of the **ExET model**



"This was great, a good summary for management: to show them what needs to be done in order to make things work"

Daniel Ståhl



Torvald Mårtensson



Antonio Martini



Jan Bosch



#29 Project Goals

Combine **efficiency/flexibility** with **dependability/predictability**

Modeling and Analyzing
Collaborating Event-based Autonomous Systems
as Timed Critical Distributed Systems

Researchers: Marjan Sirjani, Luciana Provenzano, Sara Abbaspour Asadollah, Mahshid Helali Moghadam and Mehrdad Saadatmand, Ali Sedaghat, Giorgio Forcina, Ehsan Khamespanah, Ali Jafari



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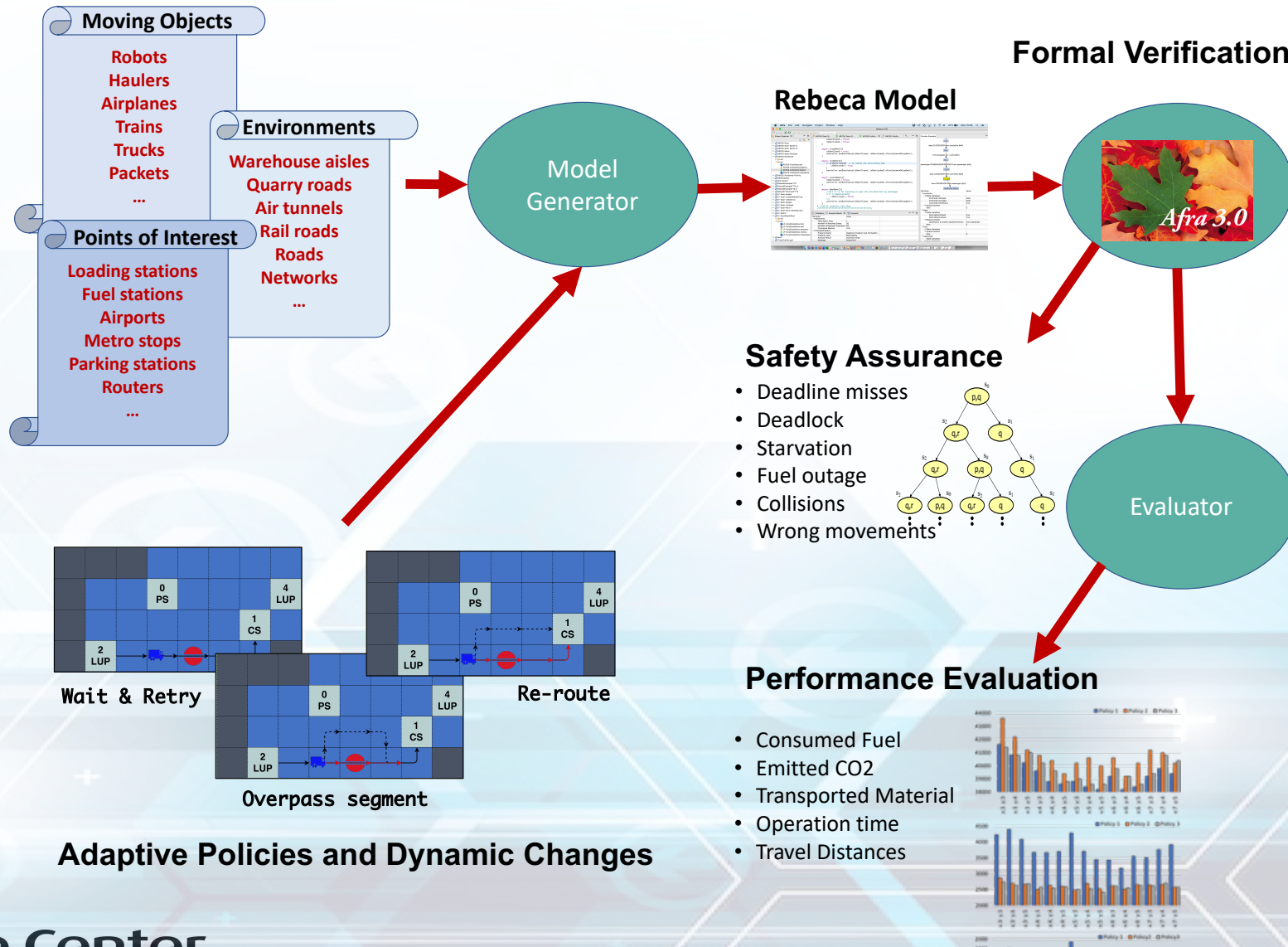


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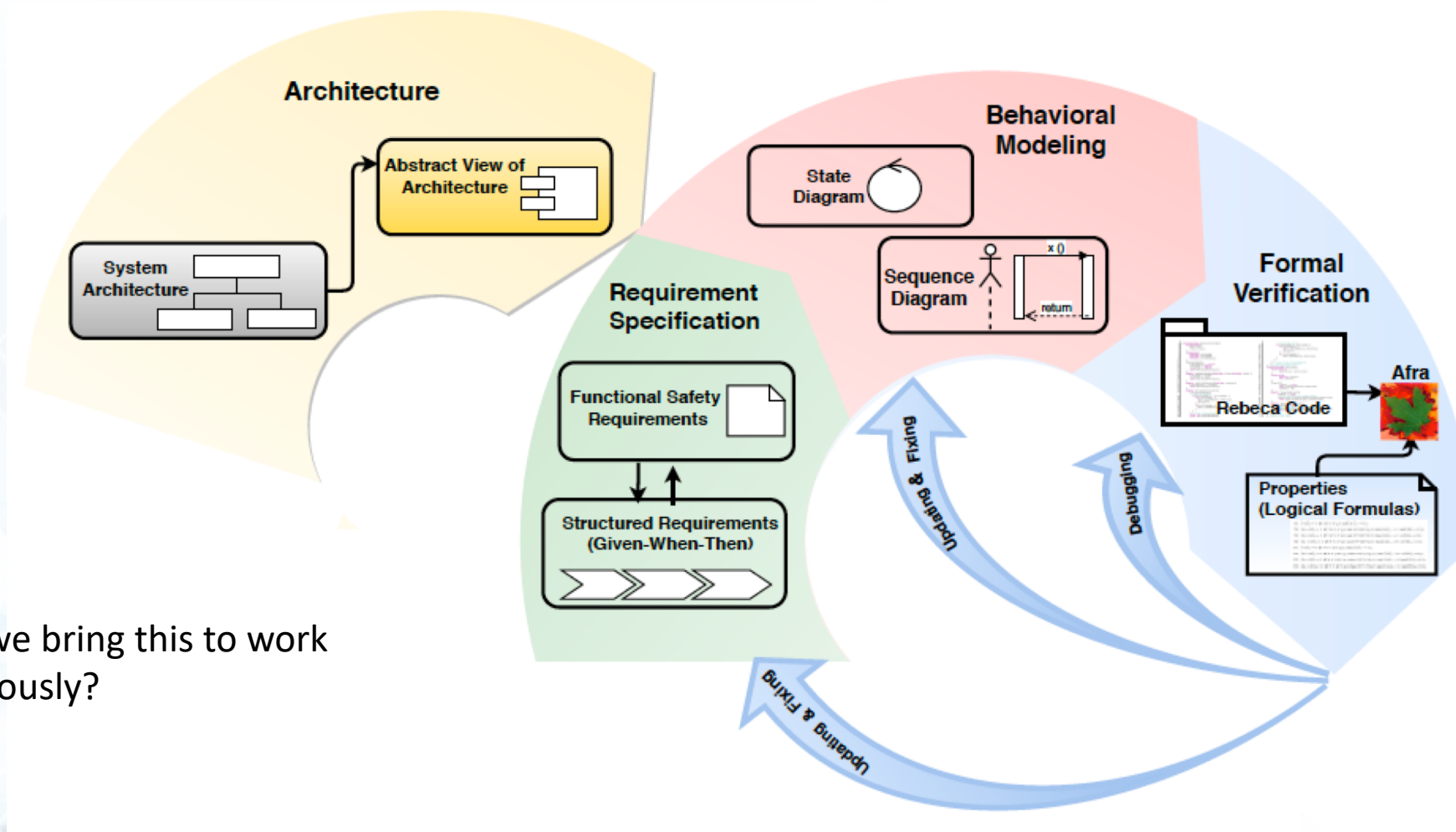


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Design and Analysis of Flow Management Systems



Verification-Driven Iterative Development of Cyber-Physical System



Continuous safety

#30 Software Center – Project AAT3 Reporting workshop



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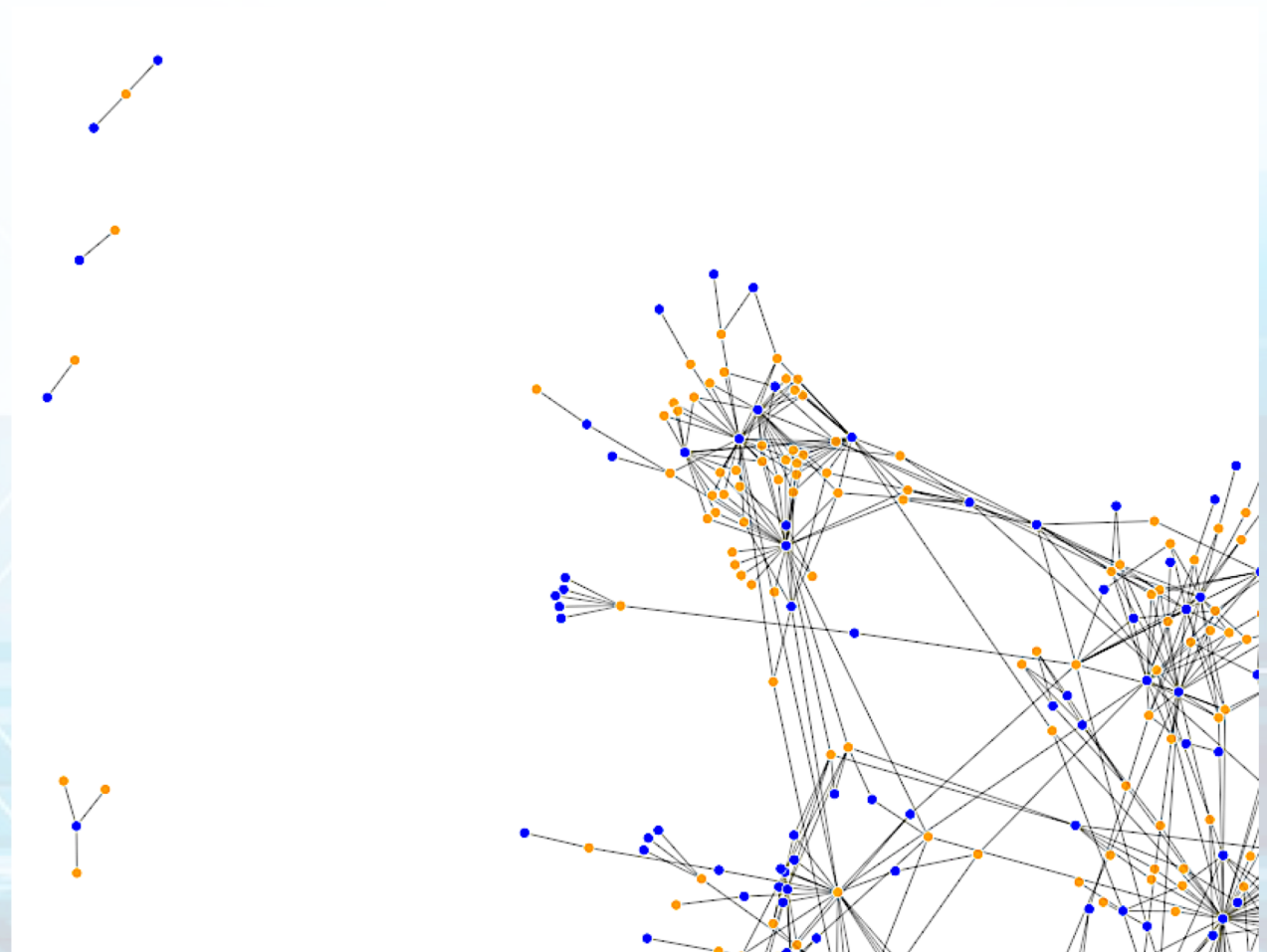
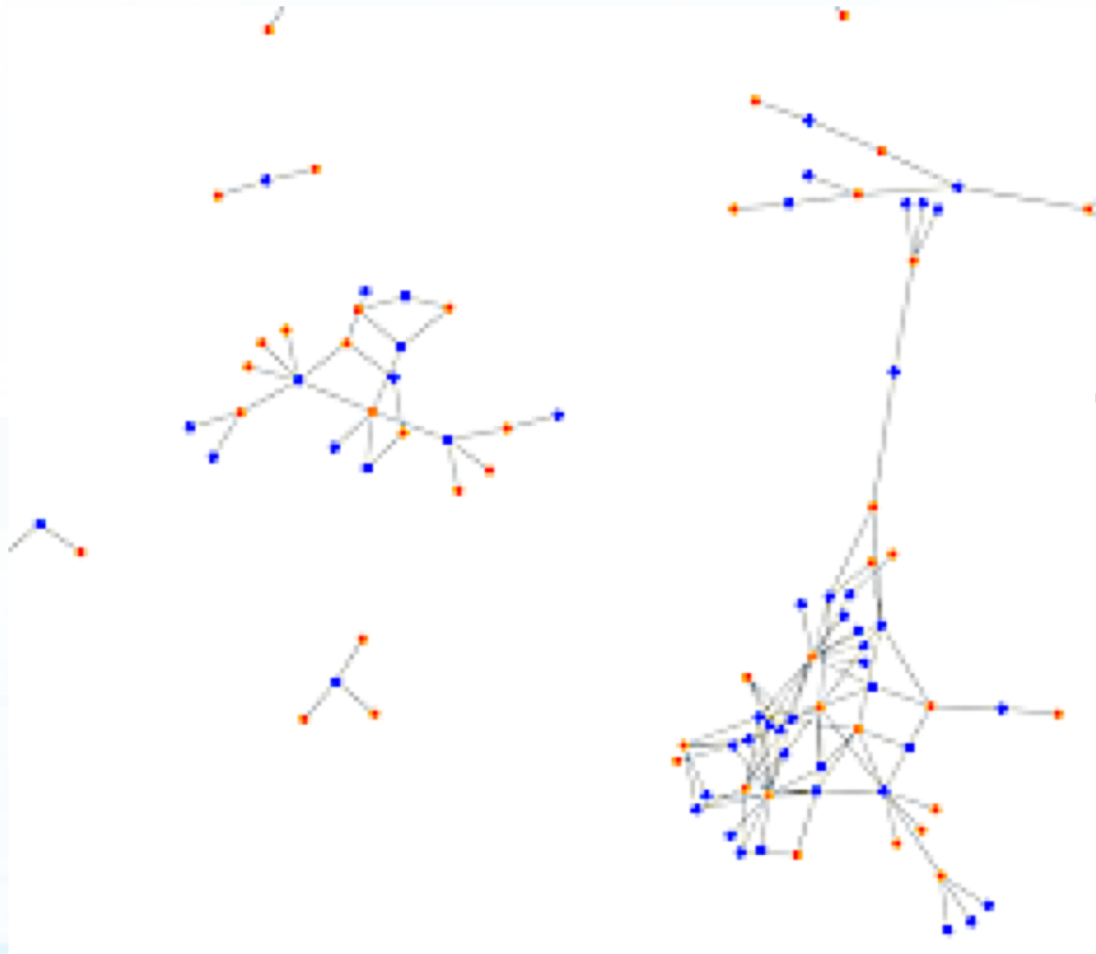


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Unsupervised learning on Test Visualization

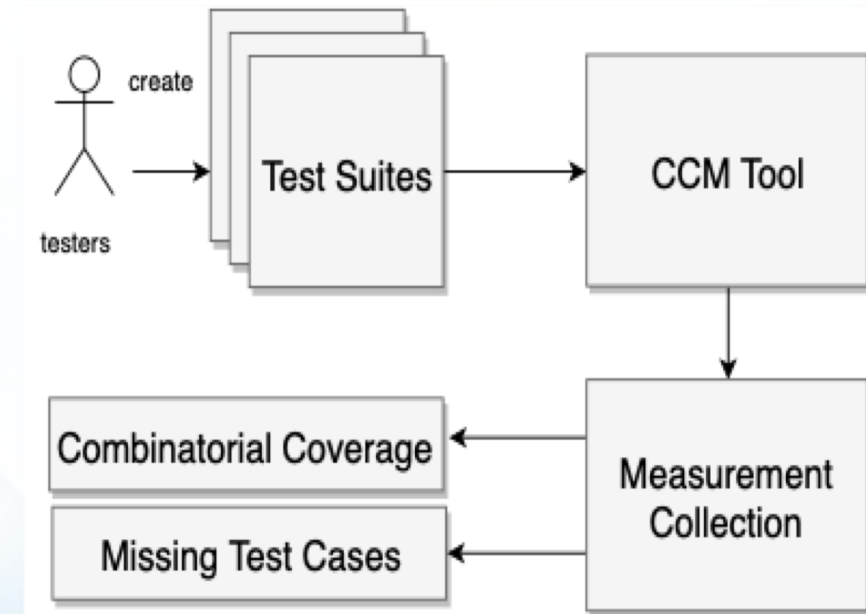
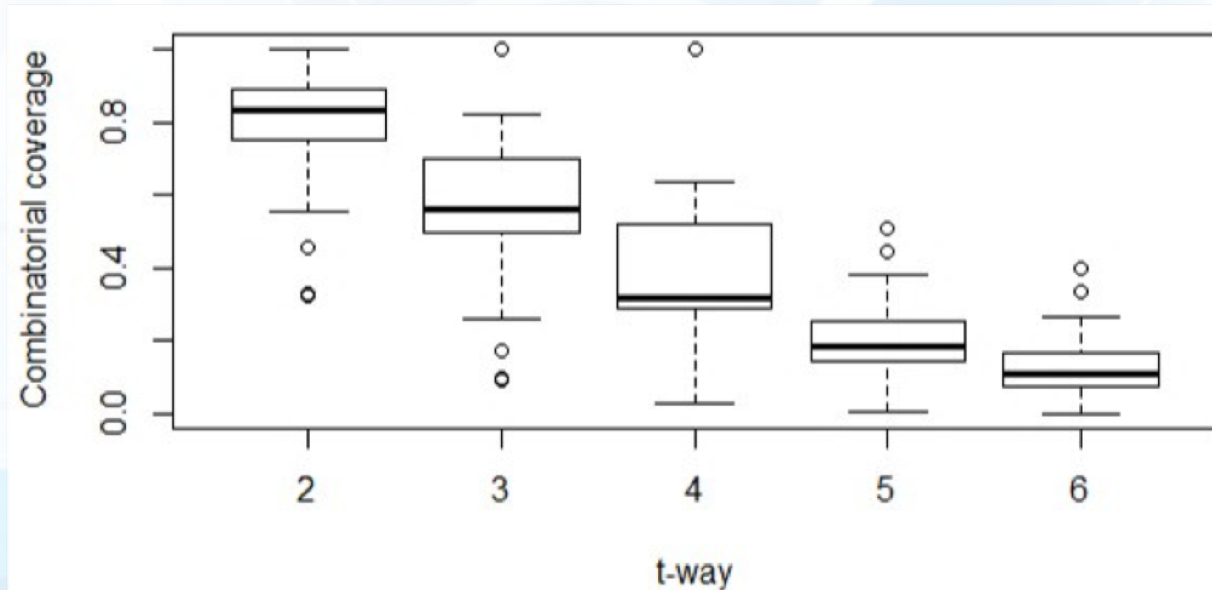


Combinatorial Test Measurement and Selection

Combinatorial testing helps in:

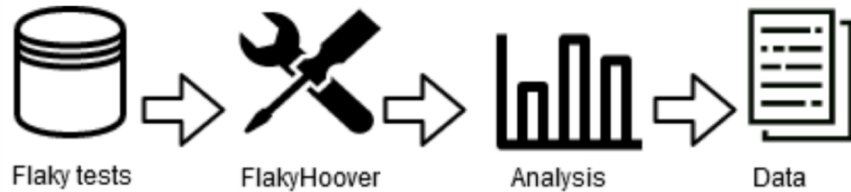
- Improving test suites
- Selecting test cases based on input space

Sprint 17: Feasibility study with input from two companies



Flaky tests

Sprint 17: Towards a flakiness detector:
Correlation between test smells and flakiness



project	test-class	test-method	smell-type	flakiness-type
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	setupBeforeClass	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	setupBeforeClass	IndirectTesting	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	IndirectTesting	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	IndirectTesting	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	IndirectTesting	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessControlFilter.java	run	IndirectTesting	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	verifyAllowed	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	verifyAllowed	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	verifyDenied	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	verifyDenied	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	run	ConditionalTestLogic	test-order-dependency
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	setupBeforeClass	FireAndForget	async-wait
hbase	hbase/security/src/test/java/org/apache/hadoop/hbase/security/access/TestAccessController.java	verifyDenied	FireAndForget	async-wait

Experience exchange

- Testing workshop at Chalmers/GU 14 November 2019
 - In-depth discussion of two companies
- Eiffel summits:
 - Ericsson, Linköping 12 September 2019
 - Axis, Lund 18-19 November 2019

Test cases are welcome!

- Let us work with your test-suite and check your diversity, flakiness, and coverage.
- Compare with other companies – how is ~~fastest~~ over the hurdles?

Number 3





Software Center

www.software-center.se
Chalmers University of Technology