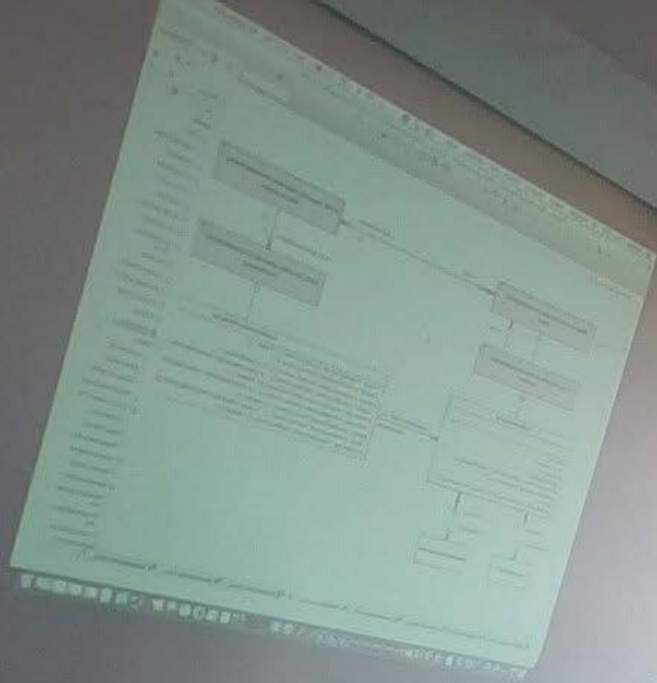# Discussion on Executable Modeling

Plenary Discussion at EXE 2016

2nd International Workshop on Executable Modeling
October 3, 2016, Saint-Malo, France

How is the state of an (f)UML model represented? (objects, state of activity executions, …)

- Can we build on instance modeling (object diagrams)?
  - No, an instance specification is a MODEL of an instance
  - I.e., an instance specification is an assertion of a runtime state

- fUML provides an own metamodel for representing the state of an executing model
  - When an activity is executed, it is instantiated; such instances are represented by the class Activity Execution
  - Same for statemachine: statemachine execution, region activation, transition activation, etc.

Ed explaining the execution model of fUML

Should the next generation of UML be an entirely executable modeling language?

- UML Version 1.1 - November 1997

- xUML (Shlaer Mellor OOA) - 2002

- UML Version 1.5 (with action semantics) - March 2003

- fUML Version 1.0 - January 2011
  - Semantics of a foundational subset for executable UML models

- PSCS Version 1.0 - October 2015
  - Precise semantics of composite structures

- PSSM Version 1.0 - underway and expected for December 2016
  - Precise semantics of state machines

- Next: Interactions?

Could more research results be shared between model interpretation and model compilation?

- Case of fUML
  - fUML is currently specified interpretative
  - This should not prevent an alternative generative implementation
  - fUML defines conformance test cases to show that both provide the same behavior

- Case of xtUML
  - Transformation language and interpreting language are the same language

What's Next for Executable Modeling?

- We need many kinds of tools for our modeling languages (model checking, debugging, animation, testing, …)

    → specify semantics once, exploit it for the different analyses

Further Questions

- Are executable models and model transformations fundamentally different?

- What is the nature of an executable model?
  - Behavior, state, step
  - ?

- Which executability concerns do comprise an executable modeling language?
  - States, steps, concurrency
  - ?