

Course Agenda, Examination

- ▶ Based on Best Practices,
- ▶ *At the University of Washington (see « preparing to teach », [link](#))*
- ▶ *At Carnegie Mellon University (see « design and Teach a course », [link](#))*

Course Agenda : IoT & Middleware

- ▶ Introduction to IoT and Middleware
- ▶ Example : MQTT (Message Queuing Telemetry Transport), publish/subscribe protocol over TCP/IP.
- ▶ Practical session with Mosquitto, an open source message broker that implements the MQTT

- ▶ Jean-Yves Tigli, I3S - UNS

15/12/2015	Tigli	Jean-Yves	IOT
15/12/2015	Tigli	Jean-Yves	IOT
16/12/2015	Tigli	Jean-Yves	IOT

Course Agenda : WoT and Dynamicity

- ▶ Introduction to WoT, with Things as Physical Data
- ▶ Example RESTful Web Service (ROA)
- ▶ Introduction to WoT, with Things as Physical Process and Phenomenon
- ▶ Example SOAP based Web Service (SOA)

- ▶ Dynamicity in WoT : DWoT

- ▶ Stéphane Lavirotte and Jean-Yves Tigli, I3S - UNS

05/01/2016	Lavirotte	Stéphane	WOT
05/01/2016	Lavirotte	Stéphane	DWOT

Course Agenda : WoT and Formal Model

- ▶ Concurrent Access to Shared Device
- ▶ Behavioral Model of Device and Synchronous Language
- ▶ Model Checking
- ▶ Validation of a Monitor to manage Multiple Accesses
- ▶ Annie Ressouche, Researcher at Inria

12/01/2016	Ressouche	Annie	WOT and Formal Model
12/01/2016	Ressouche	Annie	WOT and Formal Model
19/01/2016	Ressouche	Annie	WOT and Formal Model
19/01/2016	Ressouche	Annie	WOT and Formal Model

Formal Composition and Validation

- ▶ Why we need formal validation ?
- ▶ To anticipate to the behavior of the system on concurrent access to same Devices or even Things (Entity of Interest)
- ▶ Example : Light
- ▶ Example : Temperature in an Office

Formal Composition and Validation

- ▶ **A. Ressouche, V. Roy, J-Y Tigli and D. Cheung-Foo-Wo** "SAS architecture: Verification Oriented Formal Modeling of Concrete Critical Systems" 2003 International IEEE Conference (Systems, Man and Cybernetics), Washington.
- ▶ Toward Validated Composition in Component-based Adaptive Middleware, Annie Ressouche, Jean-Yves Tigli and Oscar Carrillo. In "SC2011", Zurich Suisse, E.J. Sven Apel (editor), LNCS Springer, July 2011, vol 6708, p 165-180, [available from](#)
- ▶ Composition and Formal Validation in Reactive Adaptive Middleware, Annie Ressouche, Jean-Yves Tigli, and Carillo Oscar. Research report, PULSAR – INRIA Sophia Antipolis - Laboratoire d'Informatique, Signaux, et Systemes de Sophia-Antipolis (I3S) / Equipe RAINBOW – Universite de Nice Sophia-Antipolis - CNRS : UMR6070, 02 2011. [Available from](#)
- ▶ Ines Sarray, Annie Ressouche, Daniel Gaffé, Jean-Yves Tigli, Stéphane Lavirotte, Safe Composition in Middleware for the Internet of Things. *Middleware for Context-aware Applications for Internet of thing (M4IoT)*, Dec 2015, Vancouver, Canada. 2015, [HAL link](#)

Course Agenda : Semantic and WoT

- ▶ Semantic and WoT
- ▶ Or how to add metadata on WoT and to reason on it
- ▶ Gerald rocher, , Ing. Research and Innovation at GFI informatic

26/01/2016	Rocher	Gerald	SWOT
26/01/2016	Rocher	Gerald	SWOT

Course Agenda : Context-aware adaptation

- ▶ Context aware adaptation and Middleware
- ▶ Stéphane Lavirotte and Jean-Yves Tigli, I3S - UNS

02/02/2016	Tigli	Jean-Yves	Context-aware adaptation
02/02/2016	Lavirotte	Stéphane	Context-aware adaptation

Examination

- ▶ Evaluated Practical Sessions (40 %)
 - ▶ For example : Synchronous Language to Model a Device Behavior and Model Checking (code and comments)
 - ▶ Others ?
- ▶ Some MCQ during sessions and a final one on all the course (30 %)
- ▶ Time-limited review of a research paper (30 %)

09/02/2016	Exam	Tigli	Jean-Yves	Examen
09/02/2016	Exam	Tigli	Jean-Yves	Examen