Rational Enterprise Architecture
Logic and Reasoning

REAL Workshop - April 7, 2017
http://www.marcvanzee.nl/REAL2017

Date, time, and location
Time: 07 April 2017, 09:30-17.00h
Location:
University of Luxembourg,
Belval Campus,
Maison du Savoir, Room 1725120, floor 17
2, avenue de l’Université, 4365 Esch-sur- Alzette (Luxembourg).

Workshop Program

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<td>09.00-09.30</td>
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| 09.30-10.15     | Farhad Arbab, CWI

*Interaction in Software Architectures*

| 10.15-10.45     | Sepideh Ghanavati, Texas Tech University

*Decision Making Process with User Requirements Notation*

| 10.45-11.15     | --- Coffee break ---                                                     |
| 11.15-12.00     | Wiebe van der Hoek, University of Liverpool

*Epistemic Logics for Gossiping*

| 12.00-14.00     | --- Lunch break ---                                                      |
| 14.00-14.30     | Egberdien van der Torre, Visual artist

*Never go for the trophy; ignore the Trojan Horse*

| 14.30-15.00     | Christoph Benzmüller, Freie Universität Berlin

*Universal Logic Reasoning via Shallow Semantical Embeddings?*

| 15.00-15.30     | Dragan Doder, University of Belgrade

*A probabilistic temporal logic with countable additivity*

| 15.30-15.45     | --- Coffee break ---                                                     |
| 15.45-16.15     | Marc van Zee, Google Research Zurich

*Graph-based representation of commonsense knowledge for NLU*

| 16.15-17.00     | Andreas Herzig, IRIT, Université Paul Sabatier

*Logics of intention and means-end reasoning*
Farhad Arbab, CWI

*Interaction in Software Architectures*

**Abstract** A major challenge in formal modeling of software architectures involves capture and analysis of concurrency protocols. Contemporary approaches to formal representation of concurrency protocols rely on traditional action-centric models of concurrency, wherein a protocol manifests itself only as an ephemeral side-effect of execution of concrete structured primitive actions that comprise pieces of software. Such representations turn a protocol into invisible, complex relationships among those structured concrete actions whose execution manifests the protocol, which in turn increases the complexity of analysis and verification of protocols and software architectures.

In this talk, we motivate the need for interaction-centric models of concurrency, and present Reo as a premier concrete example of such alternatives. Reo offers a language that treats concurrency protocols as explicit first-class constructs. More complex protocols in Reo result from composition of simpler, and eventually primitive, protocols. This yields a very expressive formal model of concurrency with highly useful software engineering properties, such as fully compositional construction and verification, scalability, and verbatim reuse. Moreover, specification of concurrency protocols in terms of Reo constructs produces connector circuits that mirror the architecture of a system with high fidelity.

**About the speaker** Farhad Arbab received his PhD in Computer Science from the University of California, Los Angeles (UCLA) in 1982. He had previously worked for IBM World Trade Corporation, Control Data Corporation, and IBM Los Angeles Scientific Center. He was a visiting Assistant Professor at UCLA, before joining the Computer Science Department faculty at the University of Southern California (USC) in 1984. He moved to Amsterdam in January 1990 and joined the Dutch national research Center for Mathematics and Computer Science (CWI) as a Senior Researcher. Currently, he is a Professor of Computer Science at Leiden University, and a Senior Researcher in the Software Engineering Department at CWI.
Abstract In this talk, Dr. Ghanavati provides an overview of the User Requirements Notation (URN) and its application in Rational Architecture process. First Dr. Ghanavati will give an overview of how URN can be extended to model different aspects of an enterprise such as principles and regulations and then will explain the integration with argumentation framework to help developing GRL models which are aligned with stakeholders’ arguments and discussions. Finally, Dr. Ghanavati will discuss how the integration of argumentation framework with Legal-URN in future can help resolving the ambiguities in the legal models and developing better compliant and well-informed models.

About the speaker I am an assistant professor in Software Engineering at the Department of Computer Science at Texas Tech University. My research interests are in the area of Regulatory Compliance Software Engineering (RCSE) and application of NLP and Requirements Engineering in privacy and security. RCSE is a young and emerging area of research in the field of software engineering and it is an interdisciplinary field which exploits methods from traditional requirements engineering, artificial intelligence, natural language processing and grounded theory to help dealing with massive legal requirements’s extractions and automatically identifying related legal requirements and developing privacy preserving software and mobile applications.
Wiebe van der Hoek, University of Liverpool

*Epistemic Logics for Gossiping*

**Abstract** Consider a multi-agent system in which each agent knows a unique secret (his birth date, or his salary, say). It is then a natural question how many phone calls it takes in order for all agents to know all secrets. In the literature, there are protocols that guarantee that such sharing of all secrets can be obtained using a minimal number of phone calls. We however move the focus to epistemic gossiping, where, rather than having a centralised protocol, the agents make their decisions on whom to call or not based on the knowledge they have. In the talk, I will discuss a number of parameters for this problem, relating to the topology of the network, what agents observe during phone calls, and as to whether the system is supposed to be synchronous or not.

**About the speaker** I am heading the Agent ART Group, whose research in agents concentrates on Logics for Agent Systems, Cooperation, Negotiation, Games and Agents, Data Mining and the Semantic Web. I am a Fellow of the British Computer Society and a College Member of the EPSRC. I am of have been organiser of the European Agent Systems Summer School (EASSS), and I was a chair of Conference on Logics for Games and Decision Theory (LOFT, 1996 - 2014, even years), and the Conference on Logics for AI (JELIA 2006), the European Workshop on Multi-Agent Systems (EUMAS 2004), and the Autonomous Agents and Multi-Agent Systems (AAMAS, 2012).
Egberdien van der Torre, Visual artist

*Never go for the trophy; ignore the Trojan Horse.*

**Abstract** What happens if an artist occupies a national museum of modern art and declares him- or herself as the new director? Is there a possibility that the artist could change an organisation’s culture that “comprises an interlocking set of goals, roles, processes, values, communications practices, attitudes and assumptions”? (Steve Denning, Forbes Magazine, 2011) Even in times of culture war, the victor claims eagerly the trophy. If a so-called appropriation artist wants to occupy the seat of the museum director with the intention of changing organizational fossilised cultures, he or she should become a smart performer by creating a Trojan Horse that no opponent could resist. In this talk I will explain how artistic appropriation can play a significant role in changing an organisation’s entrenched culture that operates in the current cultural field.

**About the speaker** Egberdien is connected to the Luxembourgish ministry of culture as visual artist and video maker. She exposes her work once a year. What? Preferably work she developed as a street artist. She is an urban explorer. In her underground role as Miss Cue she sprays graffiti and makes wall paintings in vacant buildings. She records the result on video. Egberdien registers the decay. A coincidental meeting with organ player Paul de Maeyer turned out to be a match made in heaven. Paul creates beautiful improvisations with her movies. In a church he plays the organ and she shows her images. To make it really awesome it can become technically more challenging: How cool would it be if the public can view movies on their smartphones or if there are special robots that can move on music? Or if it would be possible to work with musical improvisation and holograms? Wanted: someone to brainstorm with.
**Dragan Doder, University of Belgrade**

*A probabilistic temporal logic with countable additivity*

**Abstract** We present the proof-theoretical and model-theoretical approach to a probabilistic logic which allows reasoning about temporal information. We extend both the language of linear time logic and the language of FHM-style probabilistic logic. We completely axiomatize this logic, and we show that the problem of deciding decidability is PSPACE-complete.

**About the speaker** Dragan Doder has a PhD in mathematics. He is currently assistant professor at the university of Belgrade. His research interest focuses on applications of logic in artificial intelligence and computer science, and in particular reasoning about uncertainty, probability and inconsistency.
Marc van Zee, Google Research Zurich

Graph-based representation of commonsense knowledge for NLU

Abstract Search is evolving to answer more questions. These questions are becoming increasingly more complex such as "Best female weightlifters", or "What are the longest rivers in the UK". Google developed the Knowledge Graph as an ontology for millions of objects and billions of facts. We aim at improving text understanding by relying on a stronger semantic model for concepts and relationships.

About the speaker Marc van Zee should have finished his PhD by the time this workshop is taking place, and it now working at Google Research in Zurich.
Abstract According to Bratman's influential theory, intentions should be viewed as more or less detailed plans. Such plans are typically made up of high-level actions that cannot be executed directly: they have to be progressively refined to basic actions in order to be executable. Inspired by Shoham’s database perspective, we view basic and high-level intentions as organized in an agenda that specifies the temporal intervals within which the corresponding actions have to be performed. Agendas moreover contain beliefs about the environment in terms of beliefs about external events. Actions and events are defined in terms of their pre- and postconditions. High- and lower-level intentions are linked by the instrumentality relation, alias means-end relation. This relation plays a fundamental role in the refinement and the revision of intentions.

About the speaker Andreas Herzig is a CNRS researcher (Directeur de Recherches CNRS) in the Logic, Interaction, Language, and Computation Group (LILaC) of IRIT at Université Paul Sabatier. He is the head of IRIT’s Theme 4 "Reasoning and Decision" and was head of Theme 4’s LILaC team from 2000 to 2005. He is on the Scientific and Governing Board of the CIMI excellence lab and on the Scientific Board of the CNRS Institute for Information Sciences and Technologies (INS2I). He is an EurAI Fellow.

Andreas Herzig studied computer science in Darmstadt and Toulouse. In 1989 he obtained a Ph.D. in Computer Science at Paul Sabatier University in Toulouse on Automated Deduction in Modal Logics. Since 1990 he is a CNRS researcher (research assistant in 1990, 2nd class senior researcher in 2004, 1st class in 2014). He held visiting professor positions at the Federal University of Curitiba in 2000 (2 months), at the University of São Paulo in 2008 (3 months) and at the University of Western Sydney in 2014 (1.5 month).

His main research topic is the investigation of logical models of interaction, with a focus on logics for reasoning about knowledge, belief, time, action, intention and obligation, and the development of theorem proving methods for them. His current interests concern the integration of logics of action and change with logics of belief, including applications in belief-desire-intention logics, multiagent planning, argumentation theory and answer-set programming.

He has supervised or co-supervised 19 Phd theses.