

# Lugano ICWE2016

16<sup>th</sup> International Conference on Web Engineering  
6–9 June 2016, USI Lugano, Switzerland

## Program



# WELCOME

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Dear participant!

We would like to welcome you to the 16th International Conference on Web Engineering (ICWE 2016) hosted by the Faculty of Informatics of the University of Lugano (USI), Switzerland. Lugano, the largest town in the holiday region of Ticino, is not only Switzerland's third most important financial center, but also a pleasant town of parks and villas facing its international lake. The USI Faculty of Informatics was founded in 2004 and stands out as a center of excellence in software, systems and Web engineering research. In a matter of a few years, it has become one of Switzerland's major poles for teaching and research in Informatics, currently hosting 28 Professors and more than one hundred Post-doctoral and Pre-doctoral researchers. The Faculty aims at training informatics experts that are interdisciplinary in approach, with abstract thinking and problem solving skills, a sound knowledge in the application fields of information technologies, as well as teamwork, interpersonal communication and project-management abilities.

This year's ICWE conference program selected by the organizing committee forms a rich and balanced coverage of all current aspects of Web engineering research and industry best practices. The program is complemented by workshops on timely and emerging topics, including the second edition of the rapid mashup challenge (Monday), the Liquid software workshop (Wednesday) as well as the WS-REST, DUI, Telerise and SoWeMine workshops (all on Thursday). This year we also feature five tutorials that can be followed one after the other, building up from *Docker* (Monday), all the way to the *Inter-planetary File System* (Thursday) via *Recommender Systems meet Linked Open Data* and *Information Extraction using Web APIs* (both on Tuesday) and *Design Science* (on Wednesday). We wish to thank our outstanding keynote speakers Xin Luna Dong, James Lewis, Panos Ipeirotis for sharing their deep insights and experiences on the state of the art and the future of Web engineering.

We would also like to express our gratitude to all the institutions and sponsors supporting the 2016 edition of ICWE: the Faculty of Informatics, the University of Lugano (USI), the International Society for Web Engineering (ISWE), the Associazione Ticinese Elaborazione Dati (ATED), NOKIA, Google, Atomikos, InnoQ, Lastminute.com. Also, Springer who offered travel grants for students. A special thank you goes to the ICWE steering committee, the program chairs (Alessandro Bozzon and Philippe Cudré-Mauroux), the workshop chairs (Sven Casteleyn and Peter Dolog), the vision chairs (Oscar Diaz, Tommi Mikkonen), the industry chairs (Stefan Tilkov, Erik Wilde), the tutorial chairs (Cinzia Cappiello, Philipp Leitner), the demonstration chairs (Saeed Aghaee and Marco Brambilla), the poster chairs (Giovanni Toffetti Carughi and Manuel Wimmer), the publicity chairs (Domenico Bianculli, Michael Weiss, Liming Zhu), the PhD symposium chairs (Flavius Frasinicar, Gustavo Rossi, Marco Winckler) and the proceedings chair (Mourad Khayati). Finally, this conference would not have been possible without the excellent work of Elisa Larghi, Mauro Prevostini and Laura Heidemann-Tschanz and the enthusiasm of many student volunteers. All of them helped to make ICWE 2016 a reality and a big success.

A big thank you goes to all the researchers, practitioners and students whose active participation ensured the value of the conference. Enjoy ICWE, the lake of beautiful Lugano, the food and the sunny and friendly environment of Ticino!

Cesare Pautasso

ICWE 2016 General Chair

# ORGANIZING COMMITTEE

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Cesare Pautasso, USI Lugano, Switzerland

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Elisa Larghi, USI Lugano, Switzerland

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## Steering Committee Liaisons

Florian Daniel, Politecnico di Milano, Italy

Martin Gaedke, Chemnitz University of Technology, Germany

# SCHEDULE

## Monday, June 6th

09:00	10:30	Keynote, <i>Auditorium</i> <b>Xin Luna Dong</b> (Google) How Far Are We from Collecting the Knowledge in the World?		
10:30	11:00	Coffee Break		
		<b>Research Track</b> <i>Auditorium</i>	<b>Tutorials</b> <i>355</i>	<b>Workshop</b> <i>351</i>
11:00	13:00	Research Session 1 Engineering Web User Interfaces	Using Docker Containers to Improve Reproducibility in Software and Web Engineering Research	Rapid Mashup Challenge
13:00	14:00	<i>Mensa</i> Lunch		
14:00	15:30	R2: Social Web	Using Docker Containers to Improve Reproducibility in Software and Web Engineering Research	Rapid Mashup Challenge
15:30	16:00	Coffee Break		
16:00	17:30	<b>Posters Demonstrations</b> , <i>Faculty of Informatics: Open Space</i>		
18:00		Meeting USI main entrance		
18:30		<b>LAC Reception</b>		

## Tuesday, June 7th

09:00	10:30	Keynote, <i>Auditorium</i> <b>James Lewis</b> (ThoughtWorks) Microservices - The Hunting of the Snark	
10:30	11:00	Coffee Break	
		<b>Research Track</b> <i>Auditorium</i>	<b>Tutorials</b> <i>355</i>
11:00	13:00	R3: Web APIs Mashups	T2: Recommender Systems meet Linked Open Data
13:00	14:00	<i>Mensa</i> Lunch	
14:00	15:30	R4: Model-driven Web Engineering	T3: A Declarative Approach to Information Extraction using Web Service APIs
15:30	16:00	Coffee Break	
16:00	17:30	R5: Web of Streams and Web of Things	T3: A Declarative Approach to Information Extraction using Web Service APIs
17:40		<b>Group A</b> meeting USI main entrance	
18:00		<b>Group B</b> meeting USI main entrance	
18:00, 18:20		<b>Gala Dinner</b>	

# SCHEDULE

## Wednesday, June 8th

09:00	10:30	Keynote, <i>Auditorium</i> <b>Panos Ipeirotis</b> (NY University) Adventures in Crowdsourcing		
10:30	11:00	Coffee Break		
		<b>Research Track</b> <i>Auditorium</i>	<b>Tutorials</b> <i>355</i>	<b>Workshop</b> <i>351</i>
11:00	13:00	R6: Linked Data	T4: Design science research in information Systems and software systems engineering	Liquid Web Workshop
13:00	14:00	<i>Mensa</i> Lunch		
14:00	15:30	R7: Quality on the Web	T4: Design science research in information Systems and software systems engineering	Liquid Web Workshop
15:30	16:00	Coffee Break		
		<i>Auditorium</i>	<i>355</i>	
16:00	17:30	R8: The Web of Crowds	PhD Symposium	
17:30	17:45	Closing Ceremony, <i>Auditorium</i>		
18:00		Meeting USI main entrance		
18:30		<b>Boat Tour</b>		

## Thursday, June 9th

		<b>Tutorials</b> <i>355</i>	<b>Workshop</b> <i>254</i>	<b>Workshop</b> <i>250</i>	<b>Workshop</b> <i>253</i>
09:00	10:30	T5: IPFS	WS-REST Workshop	DUI Workshop	Telerise Workshop
10:30	11:00	Coffee Break			
11:00	13:00	T5: IPFS	WS-REST Workshop	DUI Workshop	Telerise Workshop
13:00	14:00	<i>Mensa</i> Lunch			
14:00	15:30	T5: IPFS	WS-REST Workshop	DUI Workshop	SoWeMine Workshop
15:30	16:00	<i>Mensa</i> Coffee Break			
16:00	17:30	T5: IPFS	WS-REST Workshop		

# Monday, June 6th, 2016

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## Keynote

9:00 – 10:30, *Auditorium*

**Xin Luna Dong (Google)**

How Far Are We from Collecting the Knowledge in the World?

Session Chair: *Philippe Cudré-Mauroux*

In this talk we ask the question: How far are we from collecting the knowledge in the world? We analyze the knowledge that has been extracted to Freebase in three categories: head knowledge in head verticals (e.g., music), long-tail knowledge in head verticals, and head knowledge in long-tail verticals, showing the limitations and challenges in current knowledge-collection techniques.

We then present two key efforts at Google on collecting tail knowledge. The first, called Knowledge Vault, targeted on tail knowledge in head verticals. It used 16 extractors to periodically extract knowledge from 1B+ Webpages, obtaining 3B+ distinct (subject, predicate, object) knowledge triples. The second, called Lightweight Verticals, targets on head knowledge in tail verticals. It uses a crowd-sourcing approach to collect knowledge by annotating websites, and currently has millions of active Google Search users every day. We present some key technologies under both projects, namely, knowledge fusion for guaranteeing knowledge correctness, and knowledge-based trust for finding authoritative sources for knowledge curation.

Xin Luna Dong is a Senior Research Scientist at Google Inc. She is one of the major contributors for the Knowledge Vault project, and has led the Knowledge-based Trust project, which is called the “Google Truth Machine” by Washington’s Post. She has co-authored book “Big Data Integration”, published 65+ papers in top conferences and journals, given 20+ keynotes/invited-talks/tutorials, and got the Best Demo award in Sigmod 2005. She is the PC co-chair for WAIM 2015 and serves as an area chair for Sigmod 2017, Sigmod 2015, ICDE 2013, and CIKM 2011.

# Monday, June 6th, 2016

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## Research Track

### Research Session 1

Engineering Web User Interfaces

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11:00 – 13:00, *Auditorium*

Session Chair: *Marco Winckler*

- 11:00 *Linda Di Geronimo, Maria Husmann, Abhimanyu Patel, Can Tuerk and Moira C. Norrie* **CTAT: Tilt-and-Tap Across Devices**
- 11:30 *Alfonso Murolo and Moira Norrie* **Revisting Web Data Extraction using In-Browser Structural Analysis and Visual Cues in Modern Web Designs**
- 12:00 *Andrea Stocco, Maurizio Leotta, Filippo Ricca and Paolo Tonella* **Clustering-Aided Page Object Generation for Web Testing**
- 12:30 *Massimiliano Battan and Marco Ronchetti* **QwwwQ: Querying Wikipedia without writing queries**
- 12:45 *Antti Peuhkurinen, Andrey Fedorov and Kari Systä* **Operating System Compositor and Hardware Usage to Enhance Graphical Performance in Web Runtimes**

### Research Session 2

Social Web

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14:00 – 15:30, *Auditorium*

Session Chair: *In-Young Ko*

- 14:00 *Rowan Hoogervorst, Erik Essink, Wouter Jansen, Max van den Helder, Kim Schouten, Flavius Frasinca and Maite Taboada* **Aspect-Based Sentiment Analysis on the Web using Rhetorical Structure Theory**
- 14:30 *Jie Yang, Claudia Hauff, Geert-Jan Houben and Christiaan Titos Bolivar* **Diversity in Social Media Urban Analytics**
- 15:00 *Ivan Srba and Maria Bielikova* **Design of CQA Systems for Flexible and Scalable Deployment and Evaluation**
- 15:15 *Vittoria Cozza, Marinella Petrocchi and Angelo Spognardi* **A matter of words: NLP for quality evaluation of Wikipedia medical articles**

## Workshop

11:00 – 15:30, [351](#)

### Rapid Mashup Challenge

2nd International Rapid Mashup Challenge (RMC)

What's the most complex, expressive and elegantly constructed mashup you can build in 10 minutes with your own tool, platform or approach? Participate in the Challenge and demonstrate what you can do!

The 2nd International Rapid Mashup Challenge launches again a competition between mashup approaches/tools with special attention to their expressiveness and speed. We invite developers and researchers working on mashups, mashup tools and assisting technologies to compete in the creation of the most interesting and/or complex mashup they can develop within a given time boundary, using a given set of source components. The goal of the Challenge is to allow everybody working on mashups and composite Web applications to showcase their ideas and solutions and to establish an event that is both challenging and fun.

### Organizers:

*Florian Daniel*, University of Trento, Italy

*Martin Gaedke*, Technische Universität Chemnitz, Germany

More information: <http://challenge.webengineering.org/>

### Challenge Participants:

- *Pascal Hirmer*, **ICWE RMC 2016: FlexMash 2.0.**
- *Michael Krug, Fabian Wiedemann, Markus Ast, and Martin Gaedke*. **The Smart-Composition Approach for Creating Environment-Aware Multi-Screen Mashups.**
- *Tuan-Dat Trinh, Ba-Lam Do, Peter Wetz, Peb Ruswono Aryan, Elmar Kiesling, and A Min Tjoa*. **Linked Widgets Platform for Rapid Collaborative Semantic Mashup Development.**
- *Eduard Daoud*. **Search based Mashup/Dashboards: architecture and best practice.**
- *Jeremías P. Contell, Oscar Díaz*. **APIlet: a QBE approach to augmenting Web-based tools.**
- *Giuseppe Desolda, Carmelo Ardito, Maristella Matera*. **End-User Development for the Internet of Things: EFESTO and the 5Ws composition paradigm.**
- *Valerio Cassani, Stefano Gianelli, Maristella Matera, Riccardo Medana, Elisa Quintarelli, Letizia Tanca, Vittorio Zaccaria*. **On the Role of Context in the Design of Mobile Mashups.**



## Tutorial 1

11:00 – 15:30, [355](#)

Using Docker Containers to Improve Reproducibility in Software and Web Engineering Research

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*Jürgen Cito, Vincenzo Ferme, Harald C. Gall*

The ability to replicate and reproduce scientific results has become an increasingly important topic for many academic disciplines. In computer science and, more specifically, software and Web engineering, contributions of scientific work rely on developed algorithms, tools and prototypes, quantitative evaluations, and other computational analyses. Published code and data come with many undocumented assumptions, dependencies, and configurations that are internal knowledge and make reproducibility hard to achieve. This tutorial presents how Docker containers can overcome these issues and aid the reproducibility of research artefacts in software engineering and discusses their applications in the field.

## Demonstrations

Monday 16:00 – 17:30, [Faculty of Informatics 1st Floor Open Space](#)

- D1 *Markus Luczak-Roesch, Ramine Tinati, Saud Aljaloud, Wendy Hall and Nigel Shadbolt* **A Universal Socio-technical Computing Machine**
- D2 *Gabriela Bosetti, Sergio Firmenich, Gustavo Rossi and Marco Winckler* **Web Objects Ambient: an integrated platform supporting new kinds of Personal Web experiences**
- D3 *Evangelos Niforatos, Ivan Elhart and Marc Langheinrich* **WeatherUSI: User-based Weather Crowdsourcing on Public Displays**
- D4 *Andrea Stocco, Maurizio Leotta, Filippo Ricca and Paolo Tonella* **Automatic Page Objects Generation with APOGEN**
- D5 *Paolo Cappellari, Soon Ae Chun and Dennis Shpits* **Towards Reasoning over Health Social Data**
- D6 *Masjar Babazadeh* **Liquid, Autonomous and Decentralized Stream Processing for the Web of Things**
- D7 *Roman Fedorov, Piero Fraternali and Chiara Pasini* **SnowWatch: a multi-modal citizen science application**
- D8 *Andrea Gallidabino* **Migrating and Pairing Recursive Stateful Components between Multiple Devices with Liquid.js for Polymer**
- D9 *Markus Ast and Martin Gaedke* **Towards Handling Constraint Network Conditions between IoT Entities using Conflict-free Anti-entropy Communication**
- D10 *Andreas Thalhammer* **TagTeam: Combining Semantic Annotation and Entity Summarization**
- D11 *Jasper Oosterman, Alessandro Bozzon and Geert-Jan Houben* **CroKnow: Structured Crowd Knowledge Creation**

# Monday, June 6th, 2016

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## Posters

Monday 16:00 – 17:30, *Faculty of Informatics 1st Floor Open Space*

- P1 *Jesús López Miján, Irene Garrigos and Sergio Firmenich* **Supporting Personalization in Legacy Web Sites Through Client-Side Adaptation**
- P2 *Diego Clerissi, Maurizio Leotta, Gianna Reggio and Filippo Ricca* **A Lightweight Semi-automated Acceptance Test-Driven Development Approach for Web Applications**
- P3 *Dennis Priefer, Peter Kneisel and Gabriele Taentzer* **A Model-Driven Process to Migrate Web Content Management System Extensions**
- P4 *Olivier Liechti, Jacques Pasquier, Laurent Prévost and Pascal Gremaud* **The WoT as an Awareness Booster in Agile Development Workspaces**
- P5 *Ana Ivanchikj* **RESTful Conversation with RESTalk -the Use Case of Doodle-**

## PhD Symposium Posters

Monday 16:00 – 17:30, *Faculty of Informatics 1st Floor Open Space*

- P6 *Flor Karina Mamani Amanqui, Ruben Verborgh, Erik Mannens, Rik Van de Walle and Dilvan Moreira* **Using Spatiotemporal Information to Integrate Heterogeneous Biodiversity Semantic Data**
- P7 *Matthias Frank* **Semantic Meta Data for Geographical Information Systems**
- P8 *Alex Carmine Olivieri* **Enhancing Accuracy of Automatic Fact-Checking through the Semantic Web**
- P9 *Javed Ahmed* **A Semantic Model for Friend Segregation in Online Social Networks**
- P10 *Klesti Hoxha, Artur Baxhaku and Ilia Ninka* **Bootstrapping an Online News Knowledge Base**
- P11 *Maxim Bakaev, Martin Gaedke, Vladimir Khvorostov and Sebastian Heil* **Extending Kansei Engineering for Requirements Consideration in Web Interaction Design**

# Monday, June 6th, 2016

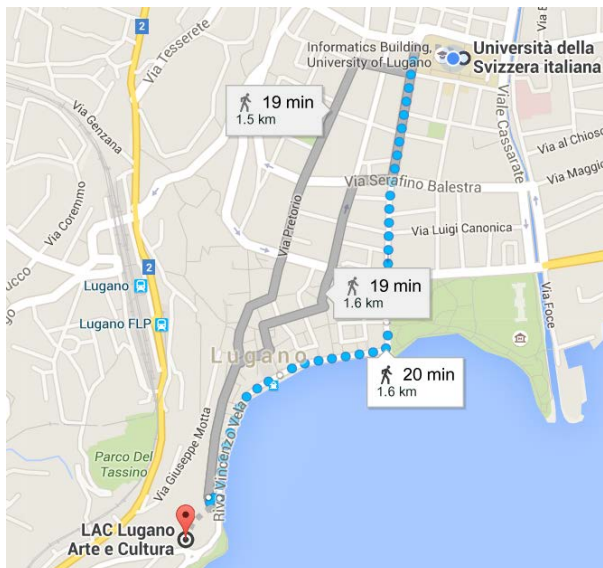
## LAC RECEPTION

### LAC, Piazza Bernardino Luini 6

The conference reception will start at 18:30 in "Sala 1".

How to get there

- bus: from USI take bus 5 from "Università" or "Corso Elvezia" to "Lugano centro", then change and take bus 1 and stop at "Piazza Luini"
- walk: meeting point at USI (main entrance) at 18:00



# Tuesday, June 7th, 2016

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## Keynote

9:00 – 10:30, *Auditorium*

**James Lewis (ThoughtWorks)**

Microservices - The Hunting of the Snark

Session Chair: *Erik Wilde*

The microservice architectural style is now one of the most talked about topics in software architecture. Large organisations are using them to deliver value into production faster than ever before. But what actually are they? What do they look like? Why should you use them?

‘They sought it with thimbles, they sought it with care; They pursued it with forks and hope;’

In this keynote, James will take you on a journey to hunt down the snark - what he finds may surprise you .

James Lewis studied Astrophysics in the 90's but got sick of programming in Fortran. As a member of the ThoughtWorks Technical Advisory Board, the group that creates the Technology Radar, he contributes to industry adoption of open source and other tools, techniques, platforms and languages. For the last few years he has been working as a coding architect on projects built using microservices; exploring new patterns and ways of working as he goes. James has spoken at many international conferences. His previous topics range from domain driven design, SOA and the future of the web to agile adoption patterns and lean thinking. He's also heavily involved in the fledgling microservice community. He rather likes the fact that he got to describe his take on things jointly with Martin Fowler in a paper that is influencing how people see the future of software architecture. Follow him @boicy

## Research Track

### Research Session 3

Web APIs and Mashups

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11:00 – 13:00, [Auditorium](#)

Session Chair: *Cinzia Cappiello*

- 11:00 *Carlos Rodriguez, Marcos Baez, Florian Daniel, Fabio Casati, Juan Carlos Trabuc-  
co, Luigi Canali and Gianraffaele Percannella* **REST APIs: A Large-Scale Analy-  
sis of Compliance with Principles and Best Practices**
- 11:30 *David Bermbach and Erik Wittern* **Benchmarking Web API Quality**
- 12:00 *Elyas Ben Hadj Yahia, Laurent Réveillère, Yérom-David Bromberg, Raphaël Che-  
valier and Alain Cadot* **Medley: An Event-Driven Lightweight Platform for  
Service Composition**
- 12:30 *Michael Hahn, Dimka Karastoyanova and Frank Leymann* **Data-Aware Service  
Choreographies through Transparent Data Exchange**
- 12:45 *Adriatik Nikaj and Mathias Weske* **Formal Specification of RESTful Choreog-  
raphy Properties**

### Research Session 4

Model Driven Web Engineering

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14:00 – 15:30, [Auditorium](#)

Session Chair: *Martin Gaedke*

- 14:00 *Ezequiel Bertti and Daniel Schwabe* **MIRA: A Model-Driven Framework for  
Semantic Interfaces for Web Applications**
- 14:30 *Darian Frajberg, Matias Urbieto and Gustavo Rossi* **Volatile Functionality in  
Action: Methods, Techniques and Assessment**
- 15:00 *Sergio Firmenich, Gabriela Bosetti, Gustavo Rossi and Marco Winckler* **Abstract-  
ing and Structuring Web contents for supporting Personal Web Experi-  
ences**

# Tuesday, June 7th, 2016

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## Research Session 5

Web of Streams and Web of Things

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16:00 – 17:30, *Auditorium*

Session Chair: *Flavius Fransincar*

- 16:00 *Maxim Kolchin, Peter Wetz, Elmar Kiesling and A Min Tjoa* **YABench: A comprehensive framework for RDF stream processor correctness and performance assessment**
- 16:30 *Shima Zahmatkesh, Emanuele Della Valle and Daniele Dell'Aglio* **When a FILTER makes the difference in continuously answering SPARQL queries on streaming and quasi-static Linked Data**
- 17:00 *Cristian Lai and Antonio Pintus* **Middleware Mediated Semantic Sensor Networks**
- 17:15 *István Koren and Ralf Klamma* **The DireWolf Inside You: End User Development for Heterogeneous Web of Things Appliances**

## Tutorial 2

11:00 – 13:00, [355](#)

Recommender Systems meet Linked Open Data

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*Tommaso Di Noia*

Information overload is a problem we daily experience when accessing information channels such as a Web site, a mobile application or even our set-top box. There is a clear need for applications able to guide users through an apparently chaotic information space thus filtering, in a personalized way, only those elements that may result of interest to them. Recommender systems have been originally conceived having e-commerce scenarios in mind but they rapidly spread to different knowledge and application domains and are nowadays a fundamental building block of many personalized information access systems. Together with the transformation of the Web from a distributed and hyperlinked repository of documents to a distributed repository of structured knowledge, in the last years, a new generation of recommendation engines has emerged. As of today, we have tons of RDF data available in the Web of Data, but only a few applications really exploit their potential power. The availability of such data is for sure an opportunity to feed personalized information access tools such as recommender systems. They rely on the use of Linked Data as a source of information to enrich items description and provide new services.

The main goals of this tutorial are:

- Provide an introduction to recommender systems by describing the main approaches available to design and feed the recommendation engine;
- Show how to exploit the information available in the Linked Open Data cloud to develop a new generation of recommender systems.

## Tutorial 3

14:00 – 17:30, [355](#)

A Declarative Approach to Information Extraction using Web Service API

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*John Samuel, Christophe Rey*

The number of diverse web services that we use regularly is significantly increasing. Most of these services are managed by autonomous service providers. It has become very difficult to get a unified view of this widespread data, which in all likelihood is substantially important to enterprises. A classical approach followed by the enterprises is to write applications using imperative languages making use of the web service API. Such an approach is not scalable and is difficult to maintain considering the ever-evolving web services landscape. This tutorial explores a declarative approach to information extraction from the web services using basic web and database technologies. It is targeted to audience from both industry as well as academia and requires a basic understanding of database principles and web technologies.

# Tuesday, June 7th, 2016

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## GALA DINNER

### Ristorante Vetta Monte Brè

In order to reach the restaurant we are going to take the Funicolare Monte Brè at Lugano-Cassarate station, Via Pico 8

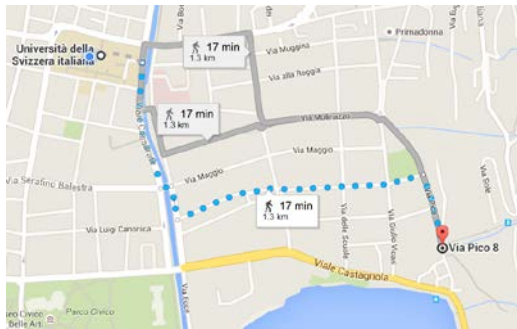
How to get there

walk: meeting point at USI (main entrance) **Group A 17:40** and **Group B 18:00**

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Return

Departure from Monte Brè station **Group A 22:30** and **Group B 22:50**. A bus from Lugano-Cassarate – La Lanchetta (viale Castagnola 16), 5 min walk from the funicular (via Pico 8), will take you to Paradiso (Novotel Hotel) with a stop in Lugano Centro.





# Wednesday, June 8th, 2016

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## Keynote

9:00 – 10:30, *Auditorium*

**Panos Ipeirotis (NY University)**

Adventures in Crowdsourcing

Session Chair: *Alessandro Bozzon*

Crowdsourcing is becoming increasingly popular in many fields. In this talk, I will describe a set of systems that we built over the last few years, which combine human and machine intelligence, to create systems that are better than using humans or computers alone. I will cover a diverse set of topics surrounding the creation of such systems, including worker quality control, fair payment schemes, vulnerability detection for machine learning systems, and how to use online advertising systems for targeting knowledgeable users. Time permitting, I will conclude with an illustration of how Mechanical Turk workers and mice are not that different after all.

Panos Ipeirotis is a Professor and George A. Kellner Faculty Fellow at the Department of Information, Operations, and Management Sciences at Leonard N. Stern School of Business of New York University. He received his Ph.D. degree in Computer Science from Columbia University in 2004. He has received nine “Best Paper” awards and nominations, a CAREER award from the National Science Foundation, and is the recipient of the 2015 Lagrange Prize in Complex Systems, for his contributions in the field of social media and crowdsourcing.

## Research Track

### Research Session 6

Linked Data

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11:00 – 13:00, *Auditorium*

Session Chair: *Daniel Schwabe*

- 11:00 *Sidra Faisal, Kemele M. Endris, Saeedeh Shekarpour and Sören Auer* **Co-evolution of RDF Datasets**
- 11:30 *Andreas Thalhammer, Nelia Lasierri Beamonte and Achim Rettinger* **LinkSUM: Using Link Analysis to Summarize Entity Data**
- 12:00 *Mohamed Ben Ellefi, Zohra Bellahsene, Stefan Dietze and Konstantin Todorov* **Beyond Established Knowledge Graphs- Recommending Web Datasets for Data Linking**
- 12:30 *Teresa Costa and José Paulo Leal* **Semantic measures: How similar? How related?**
- 12:45 *Magnus Knuth, Joerg Waitelonis and Harald Sack* **I am a Machine, let me understand Web Media!**

### Research Session 7

Quality on the Web

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14:00 – 15:30, *Auditorium*

Session Chair: *Florian Daniel*

- 14:00 *Fariz Darari, Simon Razniewski, Radityo Eko Prasajo and Werner Nutt* **Enabling Fine-grained RDF Data Completeness Assessment**
- 14:30 *Cinzia Cappiello, Tommaso Di Noia and Maristella Matera* **A Quality Model for Linked Data Exploration**
- 14:45 *Marc Hüffmeyer and Ulf Schreier* **Evaluation of an Access Control Language for RESTful Services**
- 15:00 *Javier Berrocal, Jose García-Alonso, Carlos Canal and Juan Manuel Murillo Rodríguez* **Situational-Context: A Unified View of Everything Involved at a Particular Situation**
- 15:15 *Irene Celino, Andrea Fiano and Riccardo Fino* **Analysis of a Cultural Heritage Game with a Purpose with an Educational Incentive**

# Wednesday, June 8th, 2016

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## Research Session 8

The Web of Crowds

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16:00 – 17:30, *Auditorium*

Session Chair: *Mourad Khayati*

- 16:00 *Edgar Kalkowski and Bernhard Sick* **Correlation of Ontology-Based Semantic Similarity and Crowdsourced Human Judgement for a Domain Specific Fashion Ontology**
- 16:30 *Oluwaseyi Feyisetan and Elena Simperl* **Please Stay vs Let's Play: Social Pressure Incentives in Paid Collaborative Crowdsourcing**
- 16:45 *Jasper Oosterman and Geert-Jan Houben* **On the Invitation of Expert Contributors from Online Communities for Knowledge Crowdsourcing Tasks**
- 17:00 *Naga Sai Kavya Vaddadi and Krishna Reddy Polepalli* **Coverage Patterns-based Allocation Approach for Display Advertising**

## Tutorial 4

11:00 – 15:30, [355](#)

Design science research in information systems and software systems engineering

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Roel Wieringa

The last ten years has seen a surge of interest in design science research in information systems, and of empirical research in software engineering. In this tutorial I present a framework for design science in information and software systems engineering that shows how in design science research, we iterate over designing new artifacts and empirically investigating these artifacts. To be relevant, the artifacts should potentially contribute to organizational goals, and to be empirically sound, research to validate new artifacts should provide insight into the effects of using these artifacts in an organizational context. The logic of both of these activities, design and empirical research, is that of rational decision making. I show how this logic can be used to structure our technical and empirical research goals and questions, as well as how to structure reports about our technical or empirical research. This gives us checklists for the design cycle used in technical research and for the empirical cycle used in empirical research. Finally, I will discuss in more detail what the role of theories in design science research is, and how we use theory to state research questions and to generalize the research results.

## PhD Symposium

Wednesday 16:00 – 17:30, [355](#)

Session Chairs: *Flavio Frasnica, Gustavo Rossi, Marco Winckler*

- 16:00 *Flor Karina Mamani Amanqui, Ruben Verborgh, Erik Mannens, Rik Van de Walle and Dilvan Moreira* **Using Spatiotemporal Information to Integrate Heterogeneous Biodiversity Semantic Data**
- 16:15 *Matthias Frank* **Semantic Meta Data for Geographical Information Systems**
- 16:30 *Alex Carmine Olivieri* **Enhancing Accuracy of Automatic Fact-Checking through the Semantic Web**
- 16:45 *Javed Ahmed* **A Semantic Model for Friend Segregation in Online Social Networks**
- 17:00 *Maxim Bakaev, Martin Gaedke, Vladimir Khvorostov and Sebastian Heil* **Extending Kansei Engineering for Requirements Consideration in Web Interaction Design**
- 17:15 *Klesti Hoxha, Artur Baxhaku and Ilia Ninka* **Bootstrapping an Online News Knowledge Base**

# Wednesday, June 8th, 2016

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## Workshop

11:00 – 15:30, [351](#)

### Liquid Web

1st International Workshop on Liquid Multi-Device Software for the Web

In the future we will use several Web-enabled devices both sequentially and simultaneously. Thus, users should be able to access Web applications and content from multiple devices and in multiple contexts. Web applications and data should flow seamlessly from one device or screen to another and different devices should collaborate to fulfill the users' needs. This coming era raises expectations for interoperability and adaptability, and it also calls for new architectures and design principles for Liquid Web applications. Our workshop will discuss various engineering aspects to realize the above vision in the context of Web architectures and Web applications. The expected topics include use cases, example applications, frameworks for multi-device applications, new programming paradigms, data synchronization techniques, adaptation techniques and novel liquid user experience concepts. The workshop invites full research papers and technical demos accompanied with a short paper.

More information: <http://www.tut.fi/en/liquidWS-2016/general/index.htm>

#### Organizers:

*Tommi Mikkonen*, Tampere University of Technology, Finland

*Cesare Pautasso*, USI Lugano, Switzerland

*Kari Systä*, Tampere University of Technology, Finland

*Antero Taivalsaari*, Nokia Technologies, Finland

#### Accepted Papers:

*Maria Husmann, Linda Di Geronimo and Moira Norrie*, **XD-Bike: A Cross-Device Repository of Mountain Biking Routes.**

*Enes Yigitbas, Thomas Kern, Patrick Urban and Stefan Sauer*, **Multi-Device UI Development for Task-Continuous Cross-Channel Web Applications,**

*Javier Berrocal, Jose García-Alonso, Carlos Canal and Juan Manuel Murillo Rodríguez*, **Liquid Context: Migrating the Users' Context across Devices,**

*Jari-Pekka Voutilainen, Tommi Mikkonen and Kari Systä*, **Synchronizing Application State Using Virtual DOM Trees.**

# Wednesday, June 8th, 2016

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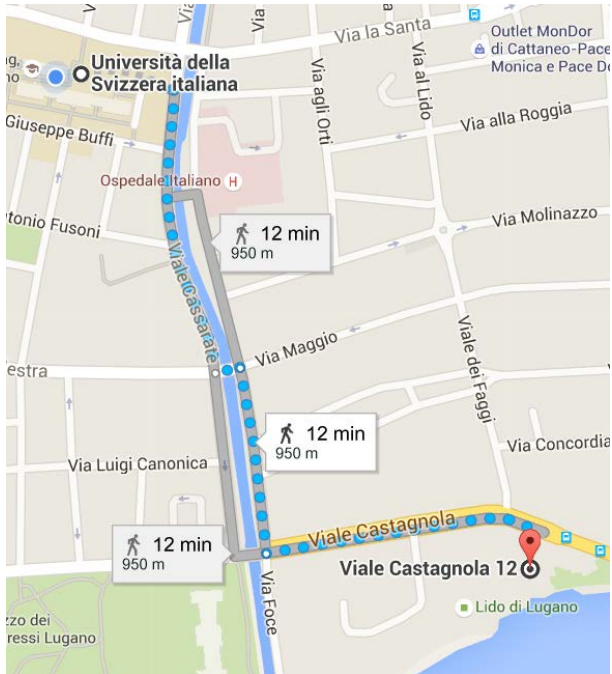
## Boat Tour

The boat will leave from Lanchetta, viale Castagnola 12, at 18:30.

How to get there

walk: meeting point at USI (main entrance) at 18:00

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## Tutorial 5

9:00 – 17:30, [355](#)

Distributed Web Applications with IPFS

*Friedel Ziegelmayer, David Dias, Juan Benet*

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IPFS, the InterPlanetary File System, is the distributed and permanent Web, a protocol to make the Web faster, more secure, open and available. IPFS could be seen as Git meets a BitTorrent swarm, exchanging objects within one Git repository. In other words, IPFS provides a high throughput content-addressed block storage model, with content-addressed hyperlinks. This forms a generalised Merkle DAG, a data structure upon which one can build versioned file systems, blockchains, and even a Permanent Web. IPFS combines a Distributed Hash Table, an incentivised block exchange, and a self-certifying namespace. IPFS has no single point of failure, and nodes do not need to trust each other.

In this full-day tutorial, participants will be able to learn about the IPFS Application Stack, namely: libp2p, the networking layer of IPFS used in order to support multi transport protocols and routing mechanisms; bitswap, the data exchange protocol that enables peers to request and offer blocks of data; Merkle DAG, a Merkle Tree type data-structure where blobs of data are referenced by their cryptographically hash, so that they can be validated with regards to integrity and discovered in the network; API, the interface used by other applications to use IPFS. This tutorial will have a presentation and hands on components, ending up with a discussion in order to help the attendees to understand how IPFS can be used for more specific use cases.

### Intended Audience

Developers, students and researchers with a general interest in cryptography, distributed systems and P2P protocols is recommended. Familiarity with JavaScript or Go are bonus.

### Learning Outcomes

- How to use IPFS to build a distributed Application
- Understand how using libp2p enables IPFS

## DUI Workshop

09:00 – 15:30, [250](#)

5th Workshop on Distributed User Interfaces: Distributing Interactions

The 5th Workshop on Distributed User Interfaces is focused on Distributing Interactions. Current technology and ICT models generate configurations where the same user interface can be offered through different interactions. These new technological ecosystems appear as a result of the existence of many heterogeneous devices and interaction mechanisms. Consequently, new conditions and possibilities arise which not only affects the distribution of the user interfaces but also the distribution of the involved users' interactions. Thus, we move the focus from addressing the distribution of user interfaces to the distribution of the users' interactions which poses new challenges that deserve to be explored. In this context Web engineering appears as a fundamental research field since it helps to develop device-independent Web applications with user interfaces capable of being distributed and accessed through different interaction modes. This fact makes Web environments to be especially interesting within the scope of this workshop. The main goal is to join people working on Distributed Interactions and share their knowledge in aspects related to new interaction paradigms such as movement-based interaction, speech recognition, gestures, touch and tangible interaction, etc., and the way we can manage them in a distributed setting.

More information: <http://dui.uclm.es>

### Organizers

*María D. Lozano*, University of Castilla-La Mancha, Spain

*José A. Gallud*, University of Castilla-La Mancha, Spain

*Víctor M. R. Penichet*, University of Castilla-La Mancha, Spain

*Ricardo Tesoriero*, University of Castilla-La Mancha, Spain

*Jean Vanderdonckt*, Université catholique de Louvain, Belgium

*Habib M. Fardoun*, King AbdulAziz University, Saudi Arabia

*Juan Enrique Garrido*, University of Castilla-La Mancha, Spain



## DUI Workshop Program

09:00	10:30	<b>Workshop Session 1</b>
Introduction (15-20 min) Mad Session (10 min) <ul style="list-style-type: none"><li>– 1 min/paper</li><li>– Who am I? Just the main idea I will present you!</li></ul>		
1. <i>Michael Krug and Martin Gaedke</i> AttributeLinking: Exploiting Attributes for Inter-Component Communication		
2. <i>Juan Enrique Garrido Navarro, Víctor M. R. Penichet and Maria-Dolores Lozano</i> Improving Context-awareness in Healthcare through Distributed Interactions		
10:30	11:00	Coffee Break
11:00	13:00	<b>Workshop Session 2</b>
1. <i>Amira Bouabid, Sophie Lepreux and Christophe Kolski</i> Distributed tabletops: Study involving two RFID tabletops with generic tangible objects		
2. <i>Félix Albertos Marco, Víctor M.R. Penichet and Jose A. Gallud</i> Distributing Interaction in Responsive Cross-Device Applications		
3. <i>Audrey Sanctorum and Beat Signer</i> Towards User-defined Cross-Device Interaction		
4. <i>Antonio Jesús Fernández-García, Luis Iribarne, Antonio Corral, Javier Criado and James Z. Wang</i> Optimally Storing the User Interaction in Mashup Interfaces within a Relational Database		
5. <i>Félix Albertos Marco, Víctor M.R. Penichet and Jose A. Gallud</i> Virtual Spatially Aware Shared Displays		
6. <i>Sergio Firmenich, Gabriela Bosetti, Gustavo Rossi and Marco Winckler</i> Flexible distribution of existing Web interfaces: an architecture involving developers and end-users		
13:00	14:00	Lunch
14:00	15:30	<b>Workshop Session 3</b>
<ul style="list-style-type: none"><li>– Discussion about the main ideas and results from the morning sessions</li><li>– Future research lines</li><li>– Possible collaborations</li></ul>		
15:30	16:00	Coffee Break

# Thursday, June 9th, 2016

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## TELERISE Workshop

09:00 – 13:00, [253](#)

2nd International Workshop on TEchnical and LEgal aspects of data pRivacy and SEcurity

Information sharing on the Web is essential for today's business and societal transactions. Nevertheless, such a sharing should not violate the security and privacy requirements either dictated by Law to protect data subjects or by internal regulations provided both at organisation and individual level. An effectual, rapid, and unfailing electronic data sharing among different parties, while protecting legitimate rights on these data, is a key issue with several shades. Among them, how to translate the high-level law obligations, business constraints, and users' requirements into system-level privacy policies, as well as engineering efficient and practical Web applications-based solutions for policy definition and enforcement. TELERISE aims at providing a forum for researchers and engineers, in academia as well as in industry, to foster an exchange of research results, experiences, and products in the area of privacy preserving, secure data management, and engineering on the Web, from a technical and legal perspective. The ultimate goal is to conceive new trends and ideas on designing, implementing, and evaluating solutions for privacy-preserving information sharing, with an eye to the cross-relations between ICT and regulatory aspects of data management and engineering.

More information: <http://www.iit.cnr.it/telerise2016/>

### Workshop Organizers

- *Ilaria Matteucci*, IIT-CNR, Italy
- *Paolo Mori*, IIT-CNR, Italy
- *Marinella Petrocchi*, IIT-CNR, Italy

## TELERISE Workshop Program

09:00	10:30	<b>Session 1. Security and Privacy Aspects</b>
09:00	09:30	<i>Harald Gjermundrod, Ioanna Dionysiou and Kyriakos Costa.</i> privacyTracker: A Privacy-by-Design GDPR-Compliant Framework with Verifiable Data Traceability Controls.
09:00	10:00	<i>Daniel Schougaard, Nicola Dragoni, and Angelo Spognardi.</i> Evaluation of Professional Cloud Password Management Tools.
10:00	10:30	<i>Neil Ayebe, Francesco Di Cerbo, and Slim Trabelsi.</i> Enhancing Access Control Trees for Cloud Computing.
10:30	11:00	Coffee Break
11:00	13:00	<b>Session 2. Legal Aspects</b>
11:00	12:00	Keynote. <i>Benoit Van Asbroeck</i>
12:00	12:30	<i>Kevin McGillivray, Samson Esayas, and Tobias Mahler.</i> Is a Picture Worth a Thousand Terms? Visualising Contract Terms and Data Protection Requirements for Cloud Computing Users.
12:30	13:00	<i>Francesca Mauro and Debora Stella.</i> A brief Overview of the legal instruments and the related limits for sharing data while complying with the EU Data Protection Law.
13:00	14:00	Lunch and End of the Workshop

**Thursday, June 9th, 2016**

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## **WS-REST Workshop**

09:00 – 17:30, [254](#)

7th International Workshop on Web APIs and RESTful Design

Thousands of APIs exist and their number is growing tremendously, while use cases become increasingly complex. In contrast to the human Web that users consume with browsers, Web APIs are designed to be used by machines, which makes issues surrounding their design and integration significantly diverse from that of the traditional Web. At the same time, this creates also a strong interest towards the provisioning of new added-value automated solutions on the Web, including the Web of Things.

This workshop brings together researchers and practitioners in this area by providing a structured, grounded, and very open discussion forum around the design and use of the programmable Web. This includes topics such as the REST architectural style for distributed hypermedia system development, the engineering of HTTP APIs, the life-cycle of such APIs and client applications, large-scale coordination and interaction styles for the programmable Web, as well as human-device and device-device interactions.

In a departure from previous years' format, this year's WS-REST workshop is held as an open conference. This means that it is less of a presentation-focused event, and more focusing on the participatory experience. All participants create wiki-based profiles and propose presentation topics for short or longer presentations. There is an open selection process which allows all participants to decide how the program for the day is going to look like. This is a first for WS-REST, but has been successfully tried in many other events. We are looking forward to an exciting an engaging day of discussions and debates with all WS-REST participants!

More information: <http://ws-rest.org/2016/>

### **Chairs**

*Ruben Verborgh*, Ghent University – iMinds, Belgium

*Thomas Steiner*, Google, Germany & University of Lyon, France

*Carlos Pedrinaci*, The Open University, United Kingdom

*Mike Amundsen*, CA Technologies

*Erik Wilde*, CA Technologies

*Ronnie Mitra*, CA Technologies

Thursday, June 9th, 2016

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## SoWeMine Workshop

14:00 – 15:30, [253](#)

2nd International Workshop on Mining the Social Web

Social mining is a relatively new and fast-growing research area, which includes various tasks such as recommendations, personalization, e-recruitment, opinion mining, sentiment analysis, searching for multimedia data (images, video, etc). This workshop aims to study (and even go beyond) the state of the art on social web mining and create a forum for professionals and researchers in the fields of personalization, search, text mining etc to discuss the application of their techniques and methodologies in this new and very promising research area.

### Organizers

*Spiros Sirmakessis*, Dept. of Computer and Informatics Engineering and Technological Institution of Western Greece

*Olfa Nasraoui*, University of Louisville

*Maria Rigou*, University of Patras, Greece

*Evanthia Faliagka*, Dept. of Computer and Informatics Engineering, Technological Institution of Western Greece

### Accepted Papers:

1. *Paolo Missier, Alexander Romanovsky, Tudor Miu, Atinder Pal, Michael Daniilakis, Alessandro Garcia, Diego Cedrim and Leonardo Da Silva Sousa.* **Tracking Dengue Epidemics using Twitter Content Classification and Topic Modelling**
2. *Evanthia Faliagka, Maria Rigou and Spiros Sirmakessis.* **Identifying great teachers through their online presence**
3. *Vittoria Cozza, Van Tien Hoang, Marinella Petrocchi and Angelo Spognardi.* **Experimental measures of news personalization in Google News**

# LOCATION

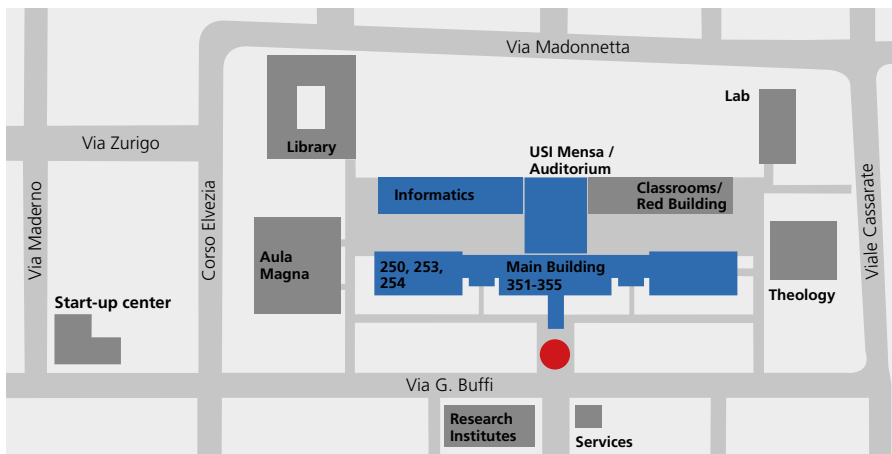
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**Lunches** will be served from 13:00-14:00 in the USI Mensa on the second floor (under the Auditorium).

**Coffee breaks** will be served outside under the Mensa, apart from the last coffee break on Thursday which will be in the Mensa. In case of rain the coffee breaks will take place in the foyer of the Auditorium otherwise at the entrance under the mensa.

The plenary keynote sessions and the research track will be in the USI Auditorium (third floor). Tutorials and the PhD Symposium will be in room 355 (third floor). Workshops on Monday and Wednesday will be in room 351 (third floor). Workshops on Thursday will be in rooms 250, 253, 254 (second floor). Demos and Posters on Monday will be in the open space of the Faculty of Informatics building (first floor).

- The meeting point for walking to the social events is in front of the USI main building.



# USEFUL INFORMATION

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## Contact and Venue Address

ICWE2016  
Faculty of Informatics  
Via G. Buffi 13  
6900 Lugano  
Switzerland  
[icwe2016@usi.ch](mailto:icwe2016@usi.ch)  
<http://icwe2016.inf.usi.ch/>

## Registration Desk

Registration will be held at the entrance of the main building (2nd floor) and in the Auditorium hall (3rd floor)

## Internet Access

Conference delegates have access to a dedicated wi-fi network (Eduroam also available):

SSID: **ICWE2016**

Password: **Lugano2016**

## Emergency numbers

ICWE2016: +41 58 666 46 90  
Funicolare Monte Brè: +41 91 971 31 71  
Ristorante Vetta: +41 91 971 21 45  
USI Campus Security: +41 58 666 47 30 (17:00-07:00)  
Ambulance: 144  
Police: 117



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