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<tr>
<th>Time</th>
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<tr>
<td>8:00-19:00</td>
<td>Registration</td>
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| 8:30-9:00    | Auditorium     | **Workshops Opening**  
[session co-chairs: Irene Garrigos and Manuel Wimmer] |
|              |                | **Liquid Multi-Device Software: 2nd International Workshop on Liquid Multi-Device Software**  
**EnWoT: 1st International Workshop on Engineering the Web of Things**  
**Keynote speech.** |
| 9:00-10:30   | Room 1         | **practi-O-web: International Workshop on The Practice Of The Open Web**  
Roberto Rodriguez-Echeverría, Javier Luis Cánovas Izquierdo and Jordi Cabot.  
Towards a UML and IFML mapping to GraphQL  
Monica Scannapieco, Raffaella Aracri, Roberta Radini and Laura Tosco.  
Using Ontologies for Official Statistics: the Istat Experience  
Lalit Sanagavarapu, Sourav Sarangi and Y. Raghu Reddy.  
ABC Algorithm for URL Extraction  
Simone Porreca, Francesco Leotta, Massimo Mecella, Stavros Vassos and Tiziana Catarcı.  
Accessing Government Open Data through Chatbots |
|              | Room 2         | **NLPIT - 3rd International Workshop on Natural Language Processing for Informal Text**  
**Introduction**  
**Keynote speech: Roberto Navigli.**  
Overcoming the Language Barrier with BabelNet and Multilingual Disambiguation of Text  
Hamdy Mubarak.  
Analysis and Quantitative Study of Egyptian Dialect On Twitter |
| 10:30-11:00  | Atrium         | **Coffee Break**                                                                 |
| 11:00-12:30  | Auditorium     | **Liquid Multi-Device Software: 2nd International Workshop on Liquid Multi-Device Software**  
**EnWoT: 1st International Workshop on Engineering the Web of Things**  
Antti Luoto and Kari Systä.  
**IoT Application Deployment Using Request-response Pattern with MQTT**  
Miika Kalske, Niko Mäkitalo and Tommi Mikkonen.  
**Challenges when Moving from Monolith to Microservice Architecture**  
Carmelo Ardito, Giuseppe Desolda and Maristella Matera.  
**Engineering Task Automation Systems for Domain Specificity** |
|              | Room 1         | **practi-O-web: International Workshop on The Practice Of The Open Web**  
**Keynote speech: Domenico Fabio Savo.**  
**Discussion**  
Giulio Ganino, Domenico Lembo and Federico Scafoglieri.  
**Ontology Population from Raw Text Corpus for Open-Source Intelligence** |
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<th>Time</th>
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<tbody>
<tr>
<td>12:30-13:30</td>
<td>Gallery</td>
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<td>15:00-15:30</td>
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<td>Room 1</td>
<td>Paolo Buono, Fabio Cassano, Alessandra Legretto and Antonio Piccinno. A Homemade Pill Dispenser Prototype Supporting Elderly [Demo Paper]</td>
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<td>Fabio Calefato, Giuseppe Iaffaldano, Filippo Lanubile, Antonio Lategano and Nicole Novielli. Mining Communication Data in a Music Community: A Preliminary Analysis. Brigitte Juanals and Jean-Luc Minel. Analyzing Museums and Key Influential Users on Twitter during the 'European Night of Museums 2016’. Open Discussion and Workshop Conclusions</td>
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<td>18:00-20:00</td>
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| 8:30-9:00 | Auditorium     | **ICWE Opening** [session co-chairs: Riccardo Torlone, Roberto De Virgilio and Jordi Cabot]  
**Welcome Message from Prof. Paolo Atzeni**  
Dean of the Department of Engineering, Roma Tre University. |
| 9:00-10:30 | Auditorium     | **ICWE Keynote 1: Barry Smith**  
FROM USER-GENERATED REVIEWS TO RECOMMENDATIONS & EXPLANATIONS  
[session chair: Jordi Cabot]  
Recommender systems are now a familiar part of the digital landscape helping us to choose which movies to watch and books to read. They guide us about where to stay and eat when we travel. They help us to keep in touch with friends and may even influence our choice of a mate. To do this recommender systems require data. Lots of data. In the early years this data came in the form of our online transactions and item ratings. More recently recommendations have been influenced by our social networks, the connections that link us, and the things that we share with others. Today there is a new form of data that has the potential to drive recommender systems of the future: user-generated reviews. Reviews are now a routine part of how we make decisions, large and small. Most of us wouldn’t dream of booking a hotel without first checking out its reviews and companies like TripAdvisor and Yelp have build billion dollar enterprises on the opinions of millions of people. In this talk we will discuss the role of user generated reviews in a new generation of recommender systems and some of the ways that opinions can be leveraged to better understand users and generate new forms of recommendations. We will focus on how opinion mining techniques can be used to extract features and sentiment from unstructured review text and ways to use this information in recommendation ranking and explanation. |
| 10:30-11:00 | Atrium         | **Coffee Break**                                                      |
| 11:00-12:30 | Auditorium     | **Web Data Management - Session 1**  
[session chair: Gerd Wagner]  
- Gabriela Bosetti, Sergio Firmenich, Alejandro Fernandez, Marco Winckler and Gustavo Rossi  
  *From Search Engines to Augmented Search Services: An End-User Development Approach* [T]  
- Dennis Diefenbach, Kuldeep Singh, Andreas Both, Didier Cherix, Christoph Lange and Sören Auer  
  *The Qanary Ecosystem: getting new insights by composing Question Answering pipelines* [T]  
- Sarven Capadisli, Amy Guy, Ruben Verborgh, Christoph Lange, Sören Auer and Tim Berners-Lee  
  *Decentralised Authoring, Annotations and Notifications for a Read-Write Web with dokieli* [A] |
| 11:00-12:30 | Room 1         | **Tutorial: Liquid Web Applications**  
Andrea Gallidabino, Tommi Mikkonen, Niko Mäkitalo, Cesare Pautasso, Kari Systä, Antero Taivalsaari and Jari-Pekka Voutilainen  
As the users possess a growing number of personal computers, smart phones, tablets, and other connected computing devices, the architecture of Web applications needs to be redesigned to enable truly seamless cross-device and multi-device use. In this tutorial, we address the Liquid Software concept in the context of Web applications. Liquid Web applications not only can take full advantage of the computing, storage and communication resources available on all devices |
owned by the end user, but also can seamlessly and dynamically migrate from one device to another, continuously following the user’s attention and context. We survey how and to which extent Web technologies can support the novel requirements of Liquid Software, showing technology demonstrations that will be discussed hands-on, at the level of source code.

12:30-13:30 Gallery  Lunch

Auditorium

Crowd and social media - Session 1  
[session chair: Manuel Wimmer]

- Ilio Catallo and Davide Martinenghi  
The Dimensions of Crowdsourcing Task Design [S]
- Francesco Buccafurri, Gianluca Lax, Serena Nicolazzo and Antonino Nocera  
Tweetchain: an Alternative to Blockchain for Crowd-Based Applications [S]
- Paolo Missier, Callum McClean, Jonathan Carlton, Diego Cedrim, Leonardo Silva, Alessandro Garcia, Alexandre Plastino and Alexander Romanovsky  
Recruiting from the network: discovering Twitter users who can help combat Zika epidemics [S]
- Fabian Gilson, Andrè Bittar and Pierre-Yves Schobbens  
Public Debates on the Web [A]
- Michela Fazzolari, Marinella Petrocchi, Alessandro Tommasi and Cesare Zavattari  
Mining Worse and Better Opinions: Unsupervised and Agnostic Aggregation of Online Reviews [A]

Room 1

Tutorial: Liquid Web Applications  
Andrea Gallidabino, Tommi Mikkonen, Niko Mäkitalo, Cesare Pautasso, Kari Systä, Antero Taivalsaari and Jari-Pekka Voutilainen

As the users possess a growing number of personal computers, smart phones, tablets, and other connected computing devices, the architecture of Web applications needs to be redesigned to enable truly seamless cross-device and multi-device use. In this tutorial, we address the Liquid Software concept in the context of Web applications. Liquid Web applications not only can take full advantage of the computing, storage and communication resources available on all devices owned by the end user, but also can seamlessly and dynamically migrate from one device to another, continuously following the user’s attention and context. We survey how and to which extent Web technologies can support the novel requirements of Liquid Software, showing technology demonstrations that will be discussed hands-on, at the level of source code.

Room 2

PhD Symposium  
[session chair: Oscar Diaz]

The symposium is arranged as a workshop where PhD students present their projects along the main landmarks of the Design Science (DS) methodology. For each landmark, (i) a brief introduction is first given by the PhD chairs, (ii) next, students flesh out these landmarks for their projects on the spot (iii) finally, a sharing presentation is made.

Time is disposed along the main DS landmarks (from Johannesson & Perjons).

- Design and Develop Artefact  
This activity creates an artefact that addresses the explicated problem and fulfils the defined requirements.
- Demonstrate Artefact  
Artefact development for an illustrative or real-life case, proving the feasibility of the artefact.
- Evaluate Artefact  
Analyse how well the artefact fulfils the requirements and to what extent it can solve, or alleviate, the practical problem that motivated the research.
### Case Studies

- **Yiea-Funk Te and Irena Pletikosa Cvijikj**  
  Design of a Small and Medium Enterprise Growth Prediction Model Based on Web Mining
- **Alejandro Pérez-Vereda and Carlos Canal**  
  A people-oriented paradigm for smart cities
- **Bahareh Zarei Mohammadzadeh and Martin Gaedke**  
  Intelligent End-User Development Platform towards Enhanced Decision-Making
- **Eleonora Cappelli and Emanuel Weitschek**  
  Extending the Genomic Data Model and the Genometric Query Language with Domain Taxonomies
- **Lalit Sanagavarapu**  
  CSQUaRE: Approach for Quality Control in Crowdsourcing
- **Diego Collarana**  
  A Semantic Integration approach for Building Knowledge Graphs On-Demand

### Schedule

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>15:00-15:30</td>
<td>Atrium</td>
<td><strong>Coffee Break</strong></td>
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</table>
| 15:30-17:00 | Auditorium  | **Big Data and Semantic Web - Session 1**  
  [session chair: Alfredo Cuzzocrea]  
  - Carlo Bernaschina, Marco Brambilla, Andrea Mauri and Eric Umahoza  
    A Big Data Analysis Framework for Model-Based Web User Behavior Analytics [T]  
  - Camilo Morales, Diego Collarana, Maria-Esther Vidal and Sören Auer  
    MateTee: A Semantic Similarity Metric Based on Translation Embeddings for Knowledge Graphs [T]  
  - Sören Auer, Simon Scerri, Mohamed Nadjib Mami, Jens Lehmanna, Hajira Jabeena, Ivan Ermilova, Aad Verstedena, Stasinos Konstantopoulos, Vangelis Karkaletsisa, Victor de Boera, Ronald Siebesa, Manolis Koubarakisb, Luigi Selmin, Sergio Albani, Angelos Charalambidis, Maria Esther Vidal and Axel-Cyrille Ngomon  
    The BigDataEurope Platform - Supporting the Variety Dimension of Big Data [T]  
  - Simone Cattani, Stefano Ceri, Abdulrahman Kaitoua and Pietro Pinoli  
    Evaluating Genomic Big Data Operations on SciDB and Spark [A]  
| 15:30-17:00 | Gallery   | **Demo Session**               |
| 15:30-17:00 | Room 2     | **PhD Symposium**              |
|            |           | [session chair: Oscar Diaz]    |
|            |           | Case Studies                   |
• Yiea-Funk Te and Irena Pletikosa Cvičikj
  Design of a Small and Medium Enterprise Growth Prediction Model Based on Web Mining
• Alejandro Pérez-Vereda and Carlos Canal
  A people-oriented paradigm for smart cities
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• Lalit Sanagavarapu
  CSQuaRE: Approach for Quality Control in Crowdsourcing
• Diego Collarana
  A Semantic Integration approach for Building Knowledge Graphs On-Demand

17:00-18:30  Auditorium  Engineering Web Application - Session 1
  [session chair: Niko Makitalo]
  • Carlo Bernaschina
    ALMOsT.js: an Agile Model to Model and Model to Text Transformation Framework [T]
  • Eda Koksal, Yeliz Yesilada and Simon Harper
    Twisting Web Pages for Saving Energy [T]
  • Andrea Gallidabino and Cesare Pautasso
    Maturity Model for Liquid Web Architectures [T]
  • Manuel Wimmer, Irene Garrigos and Sergio Firmenich
    Towards Automatic Generation of Web-based Modeling Editors [S]
### Conference Registration

#### 9:00-10:30 Auditorium

**ICWE Keynote 2: Carlo Batini**  
**BIG DATA, ABSTRACTIONS, QUALITY**  
[session chair: Paolo Atzeni]

*Big Data need for Abstractions, since their volume and velocity, together with their variety and veracity, request powerful mechanisms for representing a complex reality, while removing details and highlighting meaningful aspects. Abstractions are at the base of a wide number of disciplines such as Conceptual Modeling, Mathematics, Visualization, Formal Models, and others. Abstractions need for Quality, as the process for their production and usage is deeply influenced by their nature and variety. Quality of Abstractions and Quality of Big Data are intertwined and influence each other. In the invited speech an attempt will be made to discuss the most relevant issues on the above mentioned concepts and on their relationships.*

#### 10:30-11:00 Atrium

**Coffee Break**

#### 11:00-12:30 Auditorium

**Big Data and Semantic Web - Session 2**  
[session chair: Roberto De Virgilio]

- Marwan Al-Tawil, Vania Dimitrova, Dhaivalkumar Thakker and Alexandra Poulouvassilis  
  *Evaluating Knowledge Anchors in Data Graphs against Basic Level Objects* [T]
- Ananya Dass and Dimitri Theodoratos  
  *Trading off Popularity for Diversity in the Results Sets of Keyword Queries on Linked Data* [T]
- Natanael Arndt and Michael Martin  
  *Decentralized Evolution and Consolidation of RDF Graphs* [T]
- Maxim Bakaev, Vladimir Khvorostov, Sébastien Heil and Martin Gaedke  
  *Web Intelligence Linked Open Data for Website Design Reuse* [S]

#### 12:30-13:30 Gallery

**Lunch**

#### 13:30-15:00 Auditorium

**Web Data Management - Session 2**  
[session chair: Marco Brambilla]

- Kevin Corre, Simon Bécot, Olivier Barais and Gerson Sunyè  
  *A WebRTC Extension to Allow Identity Negotiation at Runtime* [S]
- Emilia Kacprzak, Laura Koesten, Luis-Daniel Ibáñez, Elena Simperl and Jeni Tennison  
  *A Query Log Analysis of Dataset Search* [S]
- Hamza Ed-Douibi, Javier Luis Canovas Ezquierdo and Jordi Cabot  
  *A UML profile for OData Web APIs* [S]
- Devis Bianchini, Valeria De Antonellis and Michele Melchiori  
  *Exploratory Search of Web Data Services based on Collective Intelligence* [S]
- Binh Nguyen, Kenro Aihara and Atsuhiro Takasu  
  *Collaborative Item Embedding Model for Implicit Feedback Data* [V]
### Tutorial: Model-Based Development of JavaScript Web Applications

**Gerd Wagner**

This tutorial presents a model-based approach to developing plain JavaScript web applications with responsive constraint validation, enumeration attributes, uni- and bi-directional associations, and inheritance in class hierarchies. It also shows how to implement the discussed information management concepts and techniques in a generic way in the form of three model-based development libraries: cLASSjs, mODELcLASSjs and mODELVIEWjs.

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<tr>
<th>15:00-15:30</th>
<th>Atrium</th>
<th>Coffee Break</th>
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</table>
| **Crowd and social media - Session 2**  
[session chair: Paolo Missier] | | |
| • **Ujwal Gadiraju and Ricardo Kawase**  
**Improving Reliability of Crowdsourced Results by Detecting Crowd Workers with Multiple Identities** [T] | | |
| • **Kim Schouten, Flavius Frasincar and Franciska de Jong**  
**Ontology-Enhanced Aspect-Based Sentiment Analysis** [T] | | |
| • **Marco Brambilla, Stefano Ceri, Florian Daniel and Gianmarco Donetti**  
**Temporal Analysis of Social Media Response to live events: the Milano Fashion Week** [T] | | |
| • **Luciano Barbosa**  
**Harvesting Forum Pages from Seed Sites** [A] | | |

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<tr>
<th>15:30-17:00</th>
<th>Gallery</th>
<th>Demo Session</th>
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| • **Gabriela Bosetti, Sergio Firmenich, Gustavo Rossi and Marco Winckler**  
**Supporting Mobile Web Augmentation by end users** | | |
| • **Alejandro Cortiñas, Carlo Bernaschina, Miguel R. Luaces and Piero Fraternali**  
**Improving GISBuilder with Runtime Product Preview** | | |
| • **Jesus M. Almendros-Jimenez and Antonio Becerra-Teron**  
**A Web Tool for Type Checking and Testing of SPARQL Queries** | | |
| • **Rocio Nahime Torres and Carlo Bernaschina**  
**ALMOSt-Trace: A Web Based Embeddable Tracing Tool for ALMOsT.js** | | |
| • **Arjumand Younus, Muhammad Atif Qureshi, Naiif Aljohani, Derek Greene and Michael O’Mahony**  
**TweetCric: A Twitter-based Accountability Mechanism for Cricket** | | |
| • **Andreas Both, Kuldeep Singh, Dennis Diefenbach and Ioanna Lytra**  
**Rapid Engineering of QA systems using the light-weight Qanary Architecture** | | |

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| Room 1 | Tutorial: Big Web Data: Warehousing and Analytics -- Recent Trends and Future Challenges  
Alfredo Cuzzocrea |
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<td>Big Web Data are gaining momentum for a widespread family of applications, ranging from Web advertisement to Web recommendation systems, from Semantic Web to Social Web systems, and so forth. In all these contexts, big data methodologies and paradigms play a leading role. Big Web data warehousing and analytics are two fortunate approaches to this end, as they are effectively able to extract actionable knowledge from massive big Web data repositories. In line with this emerging research trend, this paper explores state-of-the-art big Web data warehousing and analytics proposals, and future challenges in this scientific area</td>
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<td>ICWE Concluding Remarks</td>
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