

Knowledge Graph

4S

Semantics-driven Systems Engineering

PROGRAM



https://www.omilab.org/activities/events/caise2023_kg4sdse/

Tuesday, June 13th, 2023 - Morning

09:00 - 10:30 Welcome & Keynote

Welcome Message, Robert Buchmann

Keynote: A Graph Data Model for Data Analytics and Information Integration, Nicolas Spyrtos

10:30 - 11:00 Coffee Break

11:00 - 12:30 Session 1

Chair: Fadime Kaya

Interactive Machine Learning of Knowledge Graph-based Explainable Process Analysis, Anne Füßl, Volker Nissen and Stefan Horst Heringklee

Towards Recommendations for Knowledge-graph-based Requirements Management in Construction: a Report on the EU DigiChecks Project, Bram Bazuin, Sander Stolk and Marco Stevens

Semantic Matching through Knowledge Graphs: A Smart City Case, Alexander Völz, Danial M. Amlashi and Moonkun Lee

A Weighted Knowledge Graph for Representing the Results of a Systemic Literature Review, Jolanta Graudone and Marite Kirikova

The RAI Way: A Technical Analysis and Design Method for Building Enterprise Semantic Layers, R. E. K. Stirewalt and Márton Búr

12:30 - 14:00 Lunch Break

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Zaragoza, Spain

13. June 2023

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Tuesday, June 13th, 2023 - Afternoon

14:00 - 15:30 Session 2

Chair: Alexander Völz

Employing Knowledge Graphs for Capturing Semantic Aspects of Robotic Process Automation, Ștefan Uifălean

Knowledge Engineering - Formalizing DECENT Metamodel, Angelo Fiorentino, Fadime Kaya and Paul Johannesson

Towards Crisis Response and Intervention using Knowledge Graphs - CRISP Case Study, Amin Anjomshoaa, Hannah Schuster, Johannes Wachs and Axel Polleres

Using Knowledge Graphs for Record Linkage: Challenges and Opportunities, Andreas Andreou, Donatella Firmani, Jerin George Mathew, Massimo Mecella and Michalis Pingos

A Linked Data Based Advanced Credit Rationale, Newres Al Haider, Keng Ng, Ali Hashmi, Laura Veidemane and Diederik Schut

15:30 - 16:00 Coffee Break

16:00 - 17:00 Panel Discussion & Conclusions

Expectations from Large Language Models and Deep Learning for Semantics-driven Systems Engineering

Moderator:

Dimitris Karagiannis, University of Vienna, Austria

Panellists:

Dimitris Plexousakis, Institute of Computer Science, FORTH and University of Crete, Greece

Johann Eder, Alpen-Adria University Klagenfurt, Austria

Hans-Georg Fill, University of Fribourg, Switzerland

Ulrich Frank, Duisburg-Essen Universität, Germany

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KEYNOTE



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A Graph Data Model for Data Analytics and Information Integration

Nicolas Spyrtos, Professor Emeritus, University Paris-Saclay, France

With the growing popularity of big data, many users with a variety of backgrounds seek to extract high level information from data-sets collected from various sources and combined using data integration techniques and analyzing the resulting dataset. A major challenge for research in data management is to develop tools to assist users in integrating various datasets and analyzing the result.

We present a graph data model in which the datasets of an application and their relationships are represented as a graph that we call an application context (or simply context). We define a high level language over a context based on a functional algebra comprising elementary operations on functions, namely restriction, of a function to a subset of its domain of definition, composition of two or more functions, Cartesian product projection and pairing of two or more functions.

A prominent feature of our language is that analytic queries are defined in the abstract, independently of how they are evaluated by lower level evaluation mechanisms. We show that (a) the analytic queries of our language have a powerful rewriting system that make their use appropriate for the analysis of big datasets, (b) that each query can be translated as an SQL group-by query, as a MapReduce job or as a SPARQL query which make their use appropriate for information integration and (c) that a context can serve as an interface to a data warehouse for formulating an analytic query as a sequence of clicks.



Nicolas Spyrtos
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Nicolas Spyrtos is Professor Emeritus at the University Paris-Saclay. He received his Ph.D. in Systems Engineering from Carleton University (Canada) and a Dipl.-Ing. degree from the National Technical University of Athens. Prior to his position at the University Paris-Saclay, he has worked for IBM-Greece, Bell-Northern Research in Canada, and for INRIA and the University of Orleans, in France. He also taught the database course at the "Ecole Normale Supérieure" of Paris as an adjunct professor (1997-2007). He was a Visiting Professor at the University of Hokkaido, Japan (1998-1999) and held long term visits at the Institute of Computer Science at FORTH (Crete), at the CNR of Pisa, at the Polytechnic University of Madrid and at Kasetsart University (Bangkok). His current research interests include Big Data Analytics, Conceptual Modelling, and Information Integration. He was the scientific director for over 20 national, European and international projects for INRIA and the University of Paris-Saclay. He served as a member of the Greek National Council for Research and Innovation, as a reviewer for the Hellenic Authority of Higher Education and as scientific advisor of the Japan Science and Technology agency in the CREST program.

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Expectations from Large Language Models and Deep Learning for Semantics-driven Systems Engineering

Moderator: Dimitris Karagiannis, University of Vienna, Austria

The 1st KG4SDSE workshop at CAISE 2023 will close with a panel debate on the disruptive nature of GPT-like language models and associated products such as ChatGPT. The panel will not focus on how such technologies are built or how they are positioned in the larger context of AI. Instead, the aim is to reveal what requirements and expectations are raised by different research areas related to semantics and systems engineering, considering what has been already demonstrated as well as the potential that lies ahead.

Panelists representing scientific areas such as Semantic Web, Conceptual Modeling, Service Systems, and Data Architectures will discuss how their areas of interest can benefit from, how they are disrupted by, or how they can complement the large language models and deep learning approaches that currently dominate the public understanding of AI.

Can we really expect that abstraction will be fully learned from data and signal, to fully replace design-oriented research and engineering? How do we envision the interplay between human design decisions and design decisions generated by machines? Do we expect systems to achieve sufficiently reliable automation by learning causality or will there always be a need for engineered knowledge? Can we replace all query languages with natural language, and what does that mean for design and models?

Panellists:

Dimitris Plexousakis, Institute of Computer Science, FORTH and University of Crete, Greece

Johann Eder, Alpen-Adria University Klagenfurt, Austria

Hans-Georg Fill, University of Fribourg, Switzerland

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Dimitris Plexousakis is a Professor of Computer Science at the Univ. of Crete and Head of the Information Systems Lab. He obtained a PhD in Computer Science from the Univ. of Toronto in 1996. His research interests lie in the areas of Conceptual Modeling, Knowledge Representation and Reasoning; Formal models and query languages for the Semantic Web; process and service modelling. He has extensive experience in coordinating and participating in National and European Projects and over 150 publications in peer-reviewed journals and conferences.



Johann Eder is full professor for Information and Communication Systems in the Department of Informatics-Systems of the Alpen-Adria Universität Klagenfurt, Austria. From 2005-2013 he served as Vice President of the Austrian Science Funds (FWF). He held positions at the Universities of Linz, Hamburg and Vienna and was visiting scholar at AT&T Shannon Labs, NJ. The research interests of Johann Eder are databases, information systems and data management for medical research. A particular focus of his work is the evolution of information systems and the modelling and management of temporal information and temporal constraints. Another focus is the application of Information technology for medical research from information systems for biobanking, information privacy to modelling of biological processes.



Hans-Georg Fill is full professor at the University of Fribourg, Switzerland and head of the Research Group Digitalization and Information Systems. He holds a PhD and a habilitation from the University of Vienna in business informatics. He was a visiting researcher at Stanford University, USA, Karlsruhe Institute of Technology, DE and Ecole Nationale Supérieure des Mines at St. Etienne, FR. His research activities focus on the development of IT-based modelling tools, distributed ledger technologies, visualization, and the alignment of conceptual modelling and semantic technologies.



Ulrich Frank holds the chair of Information Systems and Enterprise Modelling at the Institute of Computer Science and Business Information Systems at the University of Duisburg-Essen. His main research topic is enterprise modelling, i.e. the development and evaluation of modelling languages, methods and corresponding tools. In recent years, he focused especially on multi-level modelling languages and corresponding tools. Further areas of research include method construction, (meta) programming languages, and advanced architectures of application systems. He is also interested in the philosophy of science and fundamental questions related to the subject of research in business information systems and computer science.