Tutorial 1

Title:

Behavior-derived Reuse - Conceptual Foundations and Practical Tools for Increasing Software Reuse

Abstract:

Software reuse has many known benefits, yet in practice variants are created, challenging their identification. Identification of similar software artifacts can increase reuse in a number of scenarios, such as software product line engineering, organizational knowledge sharing, and acquisitions and mergers. In such scenarios, the similarity analysis needs to take into consideration that the software artifacts may not have been developed by the same teams, and thus may not be similar on the level of implementation.
The goal of this tutorial is to introduce researchers and practitioners to a novel approach for increasing reuse, which looks beyond implementation level similarities by analyzing behavioral similarity and making concrete reuse recommendations based on polymorphism-inspired variability mechanisms. The approach is supported by the VarMeR tool, which enables analysis of multiple large-scale projects developed in Java.

Bios:

Iris Reinhartz-Berger is affiliated with the Department of Information Systems, University of Haifa, Israel. She received her MSc and PhD in Information Management Engineering from the Technion – Israel Institute of Technology and her BSc in computer science and applied mathematics from the Technion – Israel Institute of Technology. Her research interests include conceptual modeling, domain analysis, modeling languages and techniques for analysis and design, and systems development processes. She co-organized a series of domain engineering workshops and co-edited a book entitled "Domain Engineering: Product Lines, Languages, and Conceptual Models". For the last two years she has been a co-chair of EMMSAD – a working conference, associated with CAiSE, on Exploring Modeling Methods for Systems Analysis and Development. She presented three tutorials at ER (2005, 2010, 2015) on different topics.

Anna Zamansky is affiliated with the Department of Information Systems, University of Haifa, Israel. She received her BA and MSc in Computer Science from the Technion – Israel Institute of Technology and her PhD in Computer Science from Tel Aviv University. She was a Marie Curie Postdoctoral Fellow at the Technical University of Vienna. Her research interests include formal methods in software engineering and requirements engineering. She chaired three editions of ISRALOG, the Israeli Workshop on Non-Classical Logics, co-chaired COLAFORM, a special session on Collaborative Aspects of Formal Methods at ENASE'16 and FiRE, and a workshop on Facilitating Inclusive Requirement Engineering at REFSQ'18. She presented a tutorial on Reasoning with Inconsistency at the World Congress of Universal Logic (UNILOG) 2016, Brazil.

Additional materials relevant to the tutorial to share prior to the conference:

https://sites.google.com/is.haifa.ac.il/varmer/ (the slides will be made available through this site as well).

Any special requirement/equipment:

Tutorial 2

Title:

Visual Querying on Graphs: Models and Techniques

Abstract:

Querying graph databases has emerged as an important research problem for real-world applications that center on large graph data. Given the complexity of graph query languages (e.g., SPARQL, Cypher), visual graph query interfaces make it easy for non-expert users to query such graph data repositories. In this tutorial, we survey recent developments in the emerging area of visual graph querying paradigm that bridges traditional graph querying with human computer interaction (HCI). We discuss models and techniques for visual graph query formulation, query processing, and visual exploration of graph query results. In addition, the tutorial suggests open problems and new research directions.

Bios:

Sourav S Bhowmick is an Associate Professor in the School of Computer Science and Engineering (SCSE), Nanyang Technological University. He leads the data management research group (DANTe) in SCSE. His current research interests include data management, data analytics, computational social science and network-based systems biology. He has published more than 80 papers in top-tier venues such as VLDB, SIGMOD, WWW, SIGIR, ACM MM, Bioinformatics, Biophysical Journal, and VLDB Journal. He has received Best Paper Awards at ACM CIKM 2004 and ACM BCB 2011 for papers related to evolution mining and biological network summarization, respectively. His work on influence maximization was nominated for the best paper award in ACM SIGMOD 2015. His XML data management framework for biological data was adopted by a local startup HeliXense Pte Ltd in 2002. Sourav regularly serves as a reviewer for data management, data mining, and bioinformatics conferences (e.g., SIGMOD, VLDB) and journals (e.g., VLDB Journal, Bioinformatics). He has served as a program chair/co-chair of several international conferences including IEEE BigComp 2018, DASFAA 2014, DEXA 2009, and DEXA 2008. He has been keynote and tutorial speaker for several international conferences (including SIGMOD, VLDB, ER).

Dr. Byron Choi obtained his Ph.D and MSE degrees in Computer and Information Science from the University of Pennsylvania in 2006 and 2002, respectively. He received his Bachelor of Engineering degree in Computer Engineering from the Hong Kong University of Science and Technology (HKUST). Dr. Byron Choi is an Associate Professor at the Department of Computer

Science, Hong Kong Baptist University (HKBU). Before joining Hong Kong Baptist University, he was an Assistant Professor with School of Computer Engineering / Nanyang Technological University (NTU) from 2005 to 2008. He was a research associate at the University of Edinburgh in 2005 and a summer student intern for the Galax project at AT&T Labs Florham Park. He visited HKUST theoretical computer science group in 2003. He is a member of ACM and IEEE. His research interests include graph-structured databases, database security, database usability, incremental maintenance algorithms and view updates. Dr. Choi serves as the director of a Croucher Foundation Advanced Study Institute (ASI), titled "Frontiers in Big Data Graph Research" 2015. Dr. Choi receives the HKBU president's award for the outstanding young researcher in 2016, and the best teaching award and the best research award from the Department of Computer Science in 2015 and 2014, respectively.

Additional materials relevant to the tutorial to share prior to the conference:

n/a

Any special requirement/equipment:

n/a

Tutorial 3

Title:

Conceptualizing Analytics

Abstract:

Business intelligence and data analytics projects often involve low-level, ad hoc data wrangling and programming, often resulting in high development effort and low usability of analytics solutions. Conceptual modeling allows us to move data analytics onto a higher level of abstraction, facilitating the implementation and use of analytics solutions. This tutorial gives an overview of conceptual modeling methods along the (big) data analysis pipeline, based on literature and experience from cooperative research projects with industry. The tutorial targets practitioners involved in the planning and implementation of analytics projects as well as researchers interested in the state of the art and open research questions of business intelligence and data analytics.

Bios:

Christoph G. Schuetz is Assistant Professor at the Department of Business Informatics - Data & Knowledge Engineering at Johannes Kepler University (JKU) Linz, Austria. He received his diploma and doctorate degrees in business informatics from JKU Linz in 2010 and 2015, respectively. While pursuing his doctoral degree, he visited Lois M. L. Delcambre's group at Portland State University on a Marshall Plan Scholarship in 2012, and Marc H. Scholl's group at the University of Konstanz in Germany on a Marietta Blau Grant in 2014. In 2011, he was

awarded the TDWI Award for Diploma and Master's Theses for the best thesis on business intelligence and data warehousing in Germany, Austria, and Switzerland. He has participated in multiple joint research projects with industry partners in the area of business intelligence and data analytics, the most recent being the AgriProKnow project on the development of an active semantic data warehouse for precision dairy farming. His research interests include business intelligence, semantic technologies, and business process modeling.

Michael Schrefl received his engineering degree (Dipl.- Ing.) and his doctorate in computer science from Vienna University of Technology in 1983 and 1988, respectively. In 1983/84, he studied at Vanderbilt University on a Fulbright Scholarship. From 1983 to 1992 he was with Vienna University of Techology. During 1987/88, he was on leave at GMD-IPSI (now Frauenhofer), Darmstadt. He was appointed Professor in Information Systems at Johannes Kepler University (JKU), Linz, in 1992 and Professor in Computer and Information Science at University of South Australia in 1998. He currently leads the Department of Business Informatics -- Data \& Knowledge Engineering at JKU with industry-linked projects in business intelligence and semantic systems. Michael Schrefl has published over 100 scientific journal and conference papers, many of them in areas related to the tutorial, i.e., conceptual modeling and business intelligence. His research has been funded by the Austrian Research Promotion Agency, the European Union (Horizon 2020), and the Australian Research Council. Collaboration with Siemens Munich resulted in three US patents.

Additional materials relevant to the tutorial to share prior to the conference:
n/a

Any special requirement/equipment:
n/a

Tutorial 4

Title:

Abstraction in Conceptual Models, Maps and Graphs

Abstract:

Models are ubiquitous in Computer and Information Sciences as they help us understand our physical and social environment, and also design systems that facilitate our lives. In this tutorial, we focus on three types of models that are heavily used in the literature: conceptual models, maps, and graphs (for short, CMMGs). To build and make effective use of such models, we use abstractions. An abstraction over a model m removes some detail from m, to make it easier to understand, use, analyze and manage. In this tutorial we focus on conceptual abstractions that are motivated by Cognitive Science and Philosophy, as opposed to mathematical abstractions. (Conceptual) Abstractions that have been extensively studied in the literature include generalization (is-a), aggregation (part-of), classification (instance-of), manifestation (aka materialization), contextualization (context-of) and granularization, but also

many others. The tutorial introduces a unifying syntax and semantics for CMMGs, defines the six abstractions mentioned above, and studies the way they have been used for CMMGs.

Bios:

Carlo Batini is full professor of Computer Engineering at University of Milano Bicocca, Italy. His research interests include information systems, data base modelling and design, data and information quality, service science, eGovernment planning methodologies and social value of data. His research has been published in a range of books, conference proceedings, and journals such as, e.g., ACM Computing Surveys (1986 and 2009) and ACM Transactions on Software Engineering (1984, 1986 and 1993). He has written several books for courses on data base design and data quality: in regards to the former subject we mention a book in English for Benjamin and Cumming ed., with S. Navathe and S. Ceri, on methodologies for conceptual and logical data base design, adopted in several courses and translated in Spanish, and the recent Creative Commons book on Database Modelling and Design, downloadable at http://hdl.handle.net/10281/97114. In regards to the latter subject, we mention the book with M. Scannapieco, Data and Information quality, published by Springer in 2016. In 2013 he obtained the Elsevier P.P. Chen Award in conceptual modelling. He is an ER Fellow since 2015.

John Mylopoulos is professor emeritus at the Universities of Toronto and Trento and fellow of the Royal Society of Canada. His research interests span Conceptual Modelling, Requirements Engineering and Knowledge Management. His research includes contributions on semantic data models (Taxis project, 1978), formal requirements modelling languages (RML, 1982), metamodelling languages (Telos, 1990), modelling and reasoning with non-functional requirements (NFR, 1992), agent-oriented software system methodologies (Tropos, 2004). Mylopoulos has served as programme co-chair for the International Joint Conference for Artificial Intelligence (1991), programme chair for the IEEE Requirements Engineering Conference (1997), general chair for VLDB (2004) and the IEEE Requirements Engineering Conference (2011). He was honoured with the Elsevier Peter P. Chen Award in 2010; he is also an AAAI fellow since 1994, and an ER Fellow since 2011.

Additional materials relevant to the tutorial to share prior to the conference:

n/a

Any special requirement/equipment:

n/a