SKY'2015 - Intensive School

Updated: 16/October/2015

1- Overview - Purpose

The SKY Intensive School deals with topics of importance for the Software Knowledge community, i.e. those involving Knowledge regarding all aspects of Software. Specifically, these include, but are not limited to: development, testing, requirements, specification, analysis, documentation, maintenance, reuse, research and practice, large software systems, critical systems and industrial applications.

The SKY Intensive School activities will be conducted only by invited researchers and practitioners, having significant experience in their respective fields. Typical activities, each lasting about 45 minutes, will consist of:

- Plenary and small audience lectures;
- Tutorial demonstrations of techniques;
- Hands-on laboratory-like experience sessions – to this end participants are kindly requested to bring their respective mobile computers;

The intended audience of the SKY Intensive School encompasses active professionals (researchers and practitioners) and students in their advanced years of study or learning toward their higher post-graduation degrees.

At the end of the SKY Intensive School, participants are expected to have a solid introduction to the specific fields dealt with during the SKY Intensive School – either theoretical, practical techniques or hands-on experience – enabling posterior deepening and actual application in the participant work area.

2- Participation

In order to participate in the SKY Intensive School a person just needs to register in advance for the SKY'2015 Workshop (see the web page http://www.ic3k.org/SKY.aspx).

Registration allows participation in both the SKY Workshop day and in the Intensive School. All registered participants receive the SKY'2015 materials (these consist of the SKY'2015 proceedings, including extended abstracts of the SKY Intensive School activities).

3- Program for SKY'2015 Intensive School – 1st Edition

The SKY'2015 Intensive School will be held on Friday morning 13/November/2015, as a half-day after the SKY'2015 Workshop full-day.

The program will be:

#	Hour	Lecturer	Activity	Topic	Title
	8:30		Registration		
		Session 3			
1	9:00	Reuven Yagel	Room lecture	Test Driven Software Development	**"Test Driven Design - the Modeling Aspect"**
2	9:45	Anabel Fraga	Room lecture	Ontology and Requirements	**"Quality of Requirements in the Industrial Environment"**
	10:30		Coffee Break		
		Session 4			
3	10:45	Iaakov Exman	Room lecture	Formal Concept Analysis for Software Design	**"Equivalence between Modularity Matrix and the Modularity Conceptual Lattice"**
4	11:30	Miriam Allalouf	Room lecture	Big Data and Library Discovery Tools	**"Big Data in the Library: Extending Modern Library Catalogues with Data Visualization, Linking and Mining"**
5	**12:15**	Ralf Bogusch	**Plenary Keynote Lecture**	Model-Based industrial system engineering	**"Ontology-based Systems Engineering - The Smart Way of Realizing Complex Systems"**
	13:15		Lunch Time		

4- Abstracts and Short Bios

The Abstracts of the above Lectures and Short Bios of respective lecturers are found here.

Reuven Yagel

TITLE: Test Driven Design - the Modeling Aspect

ABSTRACT

We will survey various methods in the xDD family (BDD, TDD, etc.) for requirements, documentation and testing. In addition we will consider their overall place in the software development lifecycle. We will define more precisely those processes and possible extensions. We will discuss motivations and consequences of using those methods. We will explore connections between testing, design and modeling. All these will be accompanied by an extensive example that will demonstrate the whole lifecycle.

SHORT BIO

Dr. Reuven Yagel is a lecturer at the Software Engineering Department at Azrieli - Jerusalem College of Engineering, Israel. Current research interests are resiliency and security of cloud computing infrastructure, and software engineering methods and tools in particular testing and configuration management. Dr. Yagel also has industry experience in various computing areas, e.g., command and control since 1998.

Anabel Fraga

TITLE: Quality of Requirements in the Industrial Environment

ABSTRACT

The discipline of Requirements Engineering has been promoted, implemented and deployed for more than 20 years through the impulsion of standardization agencies (IEEE, ISO, ECSS, …) and national / international organizations such as (AFIS), (GfSE), (AEIS), (INCOSE). Ever since, despite an increasing maturity, Requirements Engineering remains a discipline unequally understood and implemented, even within a same organization.

Reviews activities are time consuming and their performances are not totally satisfying, this activity relies on the expertise of the Systems Engineers completely. Advanced practices combine Requirements Engineering and Knowledge Management. The use of requirements boilerplates, patterns and ontologies controlled by natural language processing (NLP), enable to analyze the substance of requirements and help users to identify in a large set of requirements gaps such as inconstancies or similarities as: inconsistent use of measurement units in requirements, lack of domain vocabulary, multiple requirements that means the same requirement at the end, and many we could point out during the talk that will focuses on the several quality assessment functions that could be applied.

SHORT BIO

Dr. Anabel Fraga is a Computer Engineering professional. Previous to set aside in the academic work, she committed her efforts in the industry as UNIX/Windows Administrator, Application Administrator for Telecom companies, Project Management and Consultancy. She obtained in 2004 her E-commerce and Networking Msc. in the Carlos III University of Madrid and in 2010 her PhD degree in Computer Science in the same university at the Knowledge Reuse Research Group. Her central areas of research are: Software Architecture, Information Engineering, Knowledge Management, Requirement Engineering, Systems Engineering, ITIL/ISO20000 and Reuse; but she is also interested in Ethics, Innovative methods of learning for supporting new software architects and the improvement of the CS Curriculum. She is Visiting Professor of Software/Systems engineering, Information/Knowledge Engineering and Programming in Carlos III University of Madrid. She is member of ACM CSTA, INCOSE, AEIS and IASA, and she is one of the leaders of the IASA Chapter of Madrid.

Iaakov Exman

TITLE: Equivalence between Modularity Matrix and the Modularity Conceptual Lattice

ABSTRACT

Modularity Matrices of software systems, linking structors to functionals, can be put in almost block-diagonal form, where blocks reveal higher-level software modules. An alternative formalization has been independently proposed using Conceptual Lattices linking attributes to objects. This lecture shows the equivalence of Modularity Matrices to their respective Modularity Conceptual Lattices. Both formalizations support the simplest form of software composition, i.e. linear composition, expressed as an addition of independent components. This equivalence has both theoretical and practical advantages. These are illustrated by comparison of both representations for a series of case studies.

SHORT BIO

Dr. Iaakov Exman is a faculty member at The Jerusalem College of Engineering (JCE – Azrieli), at the Department of Software Engineering. He received his Ph.D. from the Hebrew University of Jerusalem and did post-doctoral research at Stanford University, California, USA. His research interests are: "Software in the Sky with Stars and Comets" where: SKY = Software Knowledge (focusing on conceptual models of software systems and on "Interestingness"); STARS = Software Theory by Algebraic Representation (whose central algebraic structure is the Modularity Matrix, within "Linear Software Models"); COMETS = Composition by Entanglement (in which Quantum Computation methods are applied to typical problems of distributed software systems).

Miriam Allalouf

TITLE: Big Data in the Library: Extending Modern Library Catalogues with Data Visualization, Linking and Mining

ABSTRACT

Academic Libraries are facing the same Big Data challenges as those existed in the Web. The library authority has to address issues as how to apply easy Google-like search in their catalogue, how to interpolate their data with other data repositories and how to store and mine their data efficiently.
This talk will present several projects in the field and discuss the challenges in the scope of big data capabilities and library cataloguing features. The VisFacet project deals with topic mapping and present a facet Visualization Module we have integrated in the library Catalogue. The LinkedData project is a backend system we have developed to enrich library catalogue searches as well as allow other sites to enjoy our collections. Another project deals with catalogue search log data mining.

SHORT BIO

Dr. Miriam Allalouf is a faculty member in the Azrieli College of Engineering (JCE), Israel. Her current research interests are in the area of distributed storage and information systems. Particularly, she conducts several research projects on library data and metadata handling.   As OSNewHorizon employee, she participated in the PCAS EU-project that deals with a distributed ecosystem for secured and trusted mobile devices. Before that she worked as a research staff member at IBM Haifa Research Labs. Her activities in IBM included storage fields (such as power management, intrusion detection and storage cloud in the frame of the VISION EU-project), networking and database. She received her B.Sc. and M.Sc. degrees in computer science from the Hebrew University in Jerusalem, Israel and her PhD degree at the Tel-Aviv University School of Electrical Engineering.

Ralf Bogusch

TITLE: Ontology-based Systems Engineering - The Smart Way of Realizing Complex Systems

ABSTRACT

Systems engineering constitutes a holistic and interdisciplinary approach to enable the realization of successful systems that meet customer expectations. Today, stakeholders demand increasingly capable systems that are growing in complexity. Model-based approaches which involve application of system modelling for requirements, design, analysis, verification, and validation, are becoming more and more popular in order to deal with the increase of system complexity. However, model-based systems engineering is still in the early stage of maturity. According to the INCOSE Systems Engineering Vision 2025, formal systems modelling based on knowledge representation will be a standard practice in the future. Advanced simulation capabilities will enable understanding of complex system behavior in a virtual environment, immersive technologies will allow data visualization, semantic web technologies will facilitate data integration, reasoning will aid decision making, and finally communication technologies will

support collaboration across interdisciplinary teams. Ontology engineering helps advance model-based systems engineering towards this vision. For example, the combination of a controlled vocabulary and underlying formalism provides the opportunity to create high-quality requirements and models, improve semantic interoperability and enable additional analysis. This talk reports about current experiences gained from the European research project CRYSTAL and the envisioned work.

SHORT BIO

Dr. Ralf Bogusch received a MS degree in Technical Cybernetics from the University of Stuttgart, Germany, in 1992 and his PhD in Computer-aided Modelling from the Technical University of Aachen, Germany, in 2001. After his academic career, he has practiced application of software and systems engineering in the aerospace and automotive industry for fifteen years. His research interests and published papers cover requirements engineering, product family management, model-based systems engineering and model-based testing. Currently he is an Expert for Validation and Verification Processes, Methods and Tools at Airbus Defence and Space. In this role he supports the Airbus Group PLM (Product Lifecycle Management) strategy, provides corporate trainings and leads improvement projects. He has represented Airbus Defence and Space in a number of EU funded ARTEMIS (Advanced Research & Technology for EMbedded Intelligence and Systems) projects on developing ontologies for systems engineering, pushing interoperability specifications towards standards and industrializing reference technology platforms for the development of safety-critical embedded systems. He received a Lean Six Sigma Black Belt degree in 2011 and the Airbus Engineering Award Top Innovation and Design in 2012.