Conference Program

8th IEEE/ACIS International Conference on Software Engineering Research, Management and Applications (SERA'2010)

Monday, May 24 – Wednesday, May 26, 2010

Montreal, Canada

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International Association for Computer and Information Science (ACIS)

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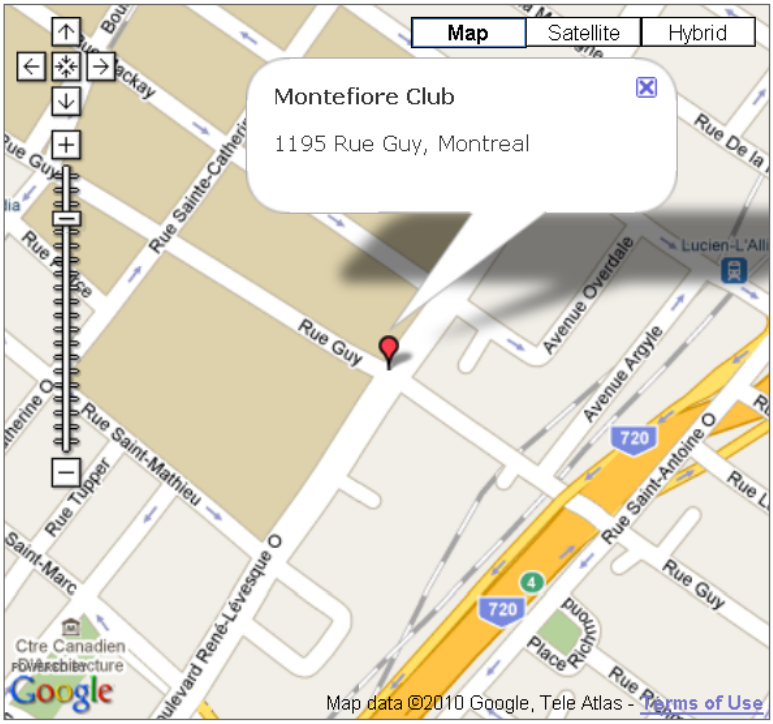
Conference Venue:

Montefiore Club

Address: *1195 Rue Guy.*

Map:



Conference Agenda:

May 24, 2010 (Monday)

07:30-16:30 Registration (Lobby at the Club entrance)

08:15-08:45 Opening Remarks (Salon B)

09:00-10:00 Keynote 1 (Salon B)

Title: *Goal-Oriented Requirements Engineering and Software Architecting*

Speaker: ***Prof. Lawrence Chung***
Department of Computer Science
The University of Texas at Dallas

Session chair: *Prof. Olga Ormandjieva*

10:00-10:30 Coffee Break (Salon C)

10:30-11:30 Keynote 2 (Salon B)

Title: *The Maturation of Software Engineering as a Discipline and Recognized Profession*

Speaker: ***Prof. Pierre Bourque***
École de technologie supérieure
Université du Québec, Canada

Session chair*: Prof. Paul Albee*

12:00 - 13:20 Luncheon (Salon C)

13:20-15:20 **SESSION 1A,** **Library** **(Artificial Intelligence, Communication Systems and Networks)** **Chair: Paul Albee**	**13:20-15:20** **SESSION 1B,** **Goldroom** **(Computer & Software Engineering)** **Chair: Olga Ormandjieva**	**13:20-15:20** **SESSION 1C,** **Boardroom** **(Requirements Engineering)** **Chair: Alain Abran**
#51 Autonomic View of Query Optimizers in Database Management Systems *Basit Raza*	**#8** Adopting a RIA-based tool for Supporting Assessment, Implementation and Learning in Software Process Improvement under the NMX-I-059/02-NYCE-2005 Standard in Small Software Enterprises. *Ivan Garcia and Dagoberto Cruz*	**#33** Representing Unique Stakeholder Perspectives in BPM Notations *Carlos Monsalve and Alain April*
#29 Repairing Service Compositions in a Changing World *Yuhong Yan, Pascal Poizat and Ludeng Zhao*	**#50** An Empirical Study of Fan-in and Fan-out in Java OSS *Emal Nasseri, Steve Counsell and Ewan Tempero*	**#5** Automated Generation of Use Case Descriptions from Problem Frames *Ali Fatolahi, Stéphane Somé and Timothy Lethbridge*
#54 Cross Engine Database Joining *Wesley Leonard and Paul Albee*	**#53** Toward a Business Model for Software Product Line Architecture *Mohammad Tanhaei, Shahrouz Moaven, Jafar Habibi and Hamed Ahmadi*	**#56** A Survey on the Importance of Some Economic Factors in the Adoption of Open Source Software *Vieri Del Bianco, Luigi Lavazza, Sandro Morasca, Davide Taibi and Davide Tosi*
#18 Access List based VLAN Map Architecture and Modified 802.1q Frame Scheme for Addressing VTP Issues *Hartinder Johal*	**#75** The Software Modeling and Implementation of Reliable Server Pooling and RSPLIB *Xing Zhou, Thomas Dreibholz, Martin Becke, Jobin Pulinthanath, Erwin P. Rathgeb and Wencai Du*	**#15** Requirements Management Tool with Evolving Traceability for the Entire Project Life Cycle *Youngki Hong*
15:30-15:40	**Coffee Break**	**(outside Boardroom)**

15:40 – 17:40 **SESSION 2A,** **Library** **(Reengineering)** **Chair: Tokuro Matsuo**	**15:40 – 17:40** **SESSION 2B** **Goldroom** **(UML, parallel and distributed computing)** **Chair: Constantinos Constantinides**	**15:40 – 17:40** **SESSION 2C,** **Boardroom** **(Requirements Engineering)** **Chair: Roger Lee**
#70 A New Algorithm based on Incentive Design in E-Commerce Systems *Koki Murakata and Tokuro Matsuo*	**#65** Verification of the Correctness in Composed UML Behavioural Diagrams *Samir Ouchani, Otmane Ait Mohamed, Mourad Debbabi and Makan Pourzandi*	**#71** Investigating the Capability of Agile Processes to Support Life-Science Regulations: The Case of XP and FDA Medical Devices' Software *Hossein Mehrfard, Heidar Pirzadeh and Abdelwahab Hamou-Lhadj*
#69 An Approach for Detecting Execution Phases of a System for the Purpose of Program Comprehension *Akanksha Agarwal, Heidar Pirzadeh and Abdelwahab Hamou-Lhadj*	**#46** L-SYNC: Larger degree clustering based time-synchronization for Wireless Sensor Network *Alireza Shameli Sendi, Masoume Jabbarifar, Hosein Pedram, Mahdi Dehghan and Michel Dagenais*	**#52** Investigation of the Capability of XP to Support the Requirements of ISO 9001 Software Process Certification. *Malik Qasaimeh and Alain Abran*
#36 Process Patterns for MDA-Based Software Development *Mohsen Asadi, Naeem Esfahani and Raman Ramsin*	**#37** Aspect-Oriented Modeling for Representing and Integrating Security Concerns in UML *Djedjiga Mouheb, Chamseddine Talhi, Mariam Nouh, Vitor Lima, Mourad Debbabi, Lingyu Wang and Makan Pourzandi*	**#24** How Do Real Options Concepts Fit in Agile Requirements Engineering? *Zornitza Racheva and Maya Daneva*
#11 Psychometric Theory applied to Questionnaire - Based Appraisals on Software Process Assessments: An initial report *Ivan Garcia and Gabriel Andrade*	**#32** A UML based deployment and management modeling for cooperative and distributed applications *Mohamed Nadhmi Miladi, Fatma Krichen, Mohamed Jmaiel and Khalil Drira*	**#28** Modeling and Validating Requirements using Executable Contracts and Scenarios *David Arnold, Jean-Pierre Corriveau and Wei Shi*

May 25, 2010 (Tuesday)

07:30-16:30 Registration (Lobby at the Club entrance)

08:00-10:00 **Workshop on Context Aware Systems** **SECASA (1)** **Library** **Chair: Serguei Mokhov**	**08:00-10:00** **Special Session on Cost Estimation, Measurement and Management CEMM(1)** **Boardroom** **Chair: Cuauhtemoc Lopez-Martin**
#61 Using the General Intensional Programming System (GIPSY) for Evaluation of Higher-Order Intensional Logic (HOIL) Expressions *Serguei Mokhov and Joey Paquet*	**#31** Comparing the Estimation Performance of the EPCU Model with the Expert Judgment Estimation Approach using Data from Industry *Francisco Valdes and Alain Abran*
#4 Towards Autonomic Specification of Distributed MARF with ASSL: Self-Healing *Emil Vassev and Serguei Mokhov*	**#66** Applying a Feedforward Neural Network for Predicting Software Development Effort of Short-scale Projects *Cuauhtemoc Lopez-Martin and Ivica Kalichanin-Balich*
#16 Code Generation for Autonomic Systems with ASSL *Emil Vassev*	**#39** A New Compound Metric for Software Risk Assessment *Ahmad Hosseingholizadeh and Abdolreza Abhari*
#17 An Operational Semantics for ASSL *Emil Vassev*	**#20** Functional requirement improvements through size measurement: a case study with inexperienced measurers *Sylvie Trudel and Alain Abran*
10:00-10:20 Coffee Break (Outside Boardroom)	

10:20-12:20 SECASA (2) **Library** **Chair: Yucong Duan**	**10:20-12:20 CEMM (2)** **Boardroom** **Chair: Ivica Kalichanin-Balich**
#34 Cryptolysis: A Framework for Verification of Optimization Heuristics for the Automated Cryptanalysis of Classical Ciphers and Natural Language Word Segmentation *Serguei Mokhov*	**#27** A Generic Model for the Specification of Software Interface Requirements and to Measure their Functional Size *Khalid Al-Sarayreh and Alain Abran*
#41 Towards a Tool Support for Specifying Complex Software Systems by Categorical Modeling Language *Noorulain Khurshid, Olga Ormandjieva and Stan Klasa*	#**40** Towards a Pattern-Based Framework for Goal-Driven Business Process Modeling *Saeed Ahmadi Behnam, Daniel Amyot and Gunter Mussbacher*
#87 Development of Mobile Agent on CBD *Haeng-Kon Kim and Sun Myung Hwang*	**#45** Process Improvement Based on Causal Networks *Reiner Dumke, Karsten Richter and Konstantina Georgieva*
#25 Managing semantics knowledge for 3D architectural reconstruction of building objects *Yucong Duan, Christophe Cruz and Christophe Nicolle*	**#47** Service-oriented Measurement Infrastructure *Reiner Dumke, Robert Neumann, Martin Kunz and A Schmietendorf*
12:20 - 13:20 Lunch on your own	
13:20 - 15:20 SECASA (3) **Library** **Chair: Joey Paquet**	**13:20 - 15:20 CEMM (3)** **Boardroom** **Chair: Juan Jose Cuadrado-Gallego**
#62 Object-Oriented Intensional Programming: Intensional Classes Using Java and Lucid *Aihua Wu, Joey Paquet and Serguei Mokhov*	**#49** Statistical Techniques Applicability during SDLC for Software Quality: Overview and Future Vision *Manar Abu Talib, Adel Khelifi, Alain Abran and Olga Ormandjieva*
#63 Advances in the Design and Implementation of a Multi-Tier Architecture in the GIPSY Environment with Java *Bin Han, Serguei Mokhov and Joey Paquet*	**#35** Analogies and differences between Machine Learning and Expert based Software Project Effort Estimation *Pablo Rodriguez-Soria, Borja Martin-Herrera, Juan Jose Cuadrado-Gallego, Miriam Martinez, Jose Javier Martinez and Dácil Castelo*
#64 A Type System for Higher-Order Intensional Logic Support for Variable Bindings in Hybrid Intensional-Imperative Programs in GIPSY *Serguei Mokhov and Joey Paquet*	**#23** Experimental study using functional size measurement in building estimation model for software project size *Nelly Condori-Fernandez, Maya Daneva, Luigi Buglione and Olga Ormandjieva*

#86 Study of one dimensional molecular properties using Python *Eric Famutimi, Micheal Stinson and Roger Lee*	**#38** Extending the UML metamodel to provide support for crosscutting concerns *Zohreh Sharafi, Parisa Mirshams, Abdelwahab Hamou-Lhadj, and Constantinos Constantinides*

15:20-15:40 Coffee Break (Outside Boardroom)

15:40 – 17:10 **SESSION 3A,** **Library** **(Economic and Financial Systems, Information Management Systems, Web Based Applications)** **Chair: Emil Vassev**	**15:40 – 17:10** **SESSION 3B,** **Goldroom** **(Formal Methods and Tools, Information Systems Engineering)** **Chair: Naohiro Ishii**	**15:40 – 17:10** **SESSION 3C,** **Boardroom** **(Quality)** **Chair: Constantinos Constantinides**
#60 Privacy Protection Mechanisms for the Web Service Technology *Diego Garcia*	**#22** Stepwise design of BPEL web services compositions an Event B refinement based approach *Idir Ait-Sadoune and Yamine Ait-Ameur*	**#13** Multi-Perspective Software Process Modeling *Kerzazi Noureddine and Robillard Pierre-N*
#6 Implementation of a Suggested E-commerce Model Based on SET Protocol *Xuan Zhang, Qinlong Huang and Peng Peng*	**#57** On Formal Modeling of TOPPERS Embedded Software *Yoshinobu Kawabe, Nobuhiro Ito and Naohiro Ishii*	**#21** Remote Automated User Testing: First Steps toward a General-Purpose Tool *Chandan Sarkar and Candace Soderston*
#73 Development of Location-Based Systems with Components *Haeng-Kon Kim,Sun-Myung Hwang*	**#58** Flexible Flow Shop Scheduling by Intelligent Multi-Agents *Wei Weng and Shigeru Fujimura*	**#48** Towards Automated Monitoring and Forecasting of Probabilistic Quality Properties in Open Source Software (OSS): A Striking Hybrid Approach #48 *Reza Meimandi Parizi and Abdul Azim Abdul Ghani*

18:30-20:30 Award Presentation and Dinner Banquet (Montefiore Lounge)

May 26, 2010 (Wednesday)

10:00 - 5:00 Individually arranged tours

The best option for the sightseeing tours would be: Gray Line Montreal Tours. They provide a wide range of tours options with different schedules to select from.

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http://www.grayline.com/grayline/destinations/canada/montreal.go

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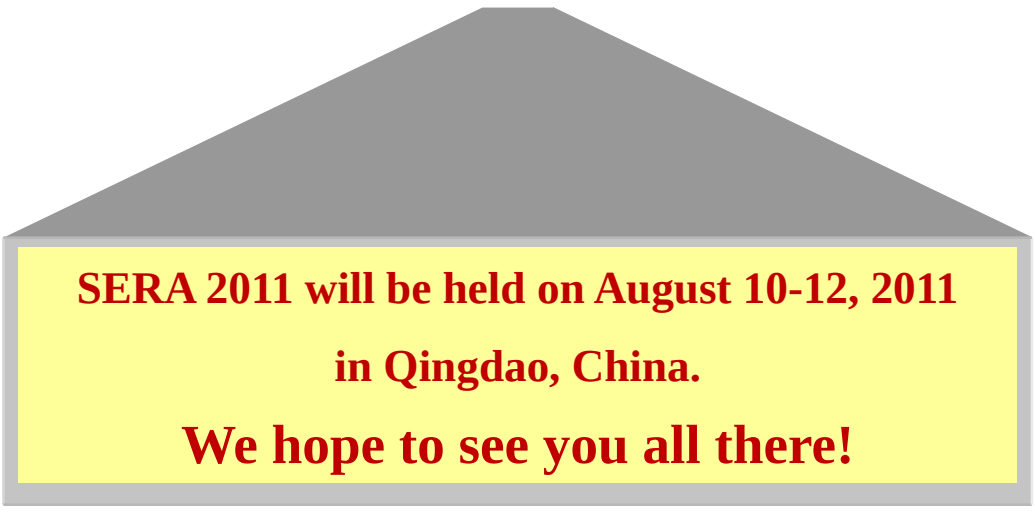

Appendix: List of Papers

ID #	Title	Authors	Summary
4	Towards Autonomic Specification of Distributed MARF with ASSL: Self-Healing	Emil Vassev and Serguei Mokhov	In this paper, we discuss our work towards self-healing property specification of an autonomic behavior in the Distributed Modular Audio Recognition Framework (DMARF) by using the Autonomic System Specification Language (ASSL). The latter aids in enhancing DMARF with an autonomic middleware that enables it to perform in autonomous systems that theoretically require less-to-none human intervention. Here we add an autonomic middleware layer to DMARF by specifying the core four stages of the DMARF's pattern-recognition pipeline as autonomic elements managed by a distinct autonomic manager. We devise the algorithms corresponding to this specification.
5	Automated Generation of Use Case Descriptions from Problem Frames	Ali Fatolahi, Stéphane Somé and Timothy Lethbridge	In order to reduce the risk of failure in software projects, it is critical to achieve a true understanding of the problem and requirements. Several requirements engineering tools and techniques have been proposed amongst which, problem-oriented approaches are recognized as techniques that start with problem analysis rather than solution analysis. Such approaches are distinguished by their ability of solving a software-related problem based on the category the problem falls into. In this paper, a mapping from problem frames (PF) as one problem-oriented approach to use cases as the most popular requirements engineering technique is provided. Bridging problem frames with use cases is important for benefiting from the popularity of use cases while observing the advantages of problem frames. It can also build up a trust to PF approaches within the software engineering community.
6	Implementation of a Suggested E-commerce Model Based on SET	Xuan ZHANG, Qinlong HUANG and Peng PENG	SET (Secure Electronic Transaction) was developed by Visa and MasterCard as a method to protect the security of payment card transactions over open networks,

	Protocol		but it failed to be widely promoted. Based on our research about SET protocol, we designed and implemented a suite of e-commerce system which was improved from SET protocol. Our main contributions are to firstly apply the proper network technologies of thin client to build the E-commerce model, and develop a method of database encryption to protect the security of transaction information; also we change the transaction flow and payment process for the aim of practicability and atomicity.
8	Adopting a RIA-based tool for Supporting Assessment, Implementation and Learning in Software Process Improvement under the NMX-I-059/02-NYCE - 2005 Standard in Small Software Enterprises.	Ivan Garcia and Dagoberto Cruz	Nowadays there are models and standards which attempt to introduce quality in the enterprises' software development process with the objective to introduce high quality levels in the produced software. The NMX-I-059/02-NYCE-2005 standard (also known as MoProSoft) is focused on small and medium software enterprises, or small groups of software development within a larger organization, with the aim of promoting the standardization of an effective process in the software industry. Mexican enterprises now have a software standard that enables them to achieve a high level of quality in the software that they produce. However, the adoption of any standard is not an easy task. This paper aims to show that the development and implementation of a RIA-based tool that could support improvement initiatives, therefore strengthening the standard adoption.
11	Psychometric Theory applied to Questionnaire-Based Appraisals on Software Process Assessments: An initial report	Ivan Garcia and Gabriel Andrade	Adopting a software process model for organizations requires them to begin with an appraisal of their current processes. However, the current existing automated tools for process assessments cannot verify the authenticity of answers and are therefore limited in their reliability level depending only in the employees responses. This paper presents our research in psychometric theory applied to questionnaire-based appraisals to determine feasibility of combining them together to develop a reliable assessment tool to provide more reliable evidences about organizations' current maturity/capability level. We have found a lot of work can be done to improve appraisals questionnaires with psychometric theory and we show here areas that can be improved and first steps in how it can be done.

13	Multi-Perspective Software Process Modeling	Kerzazi Noureddine and Robillard Pierre-N	This paper presents a new automated approach to software process modeling, called DSL4SPM. It implements the Software & Systems Process Engineering Meta-model (SPEM 2.0) specification, and is characterized by: 1) a conceptual framework for designing processes in an abstract way; and 2) multi-view-oriented process modeling, which acknowledges the relevance of a multitude of issues in a process model. The conceptual framework is based onnsyntax provided by SPEM 2.0. The multi-view, which is defined by new semantics, focuses on the relationships among the SPEM elements. The usefulness of the approach is demonstrated with a maintenance process.
15	Requirements Management Tool with Evolving Traceability for the Entire Project Life Cycle	Youngki Hong	There are significant factors in software project management; cost, effort, and quality. Much software engineering projects have focused on these. When it comes to software quality, customer requirements are starting points for assuring quality in software development projects. Currently, software engineering literature still finds effective ways to manage requirements within the entire project life cycle, but does not have a complete solution for it. Besides, some solutions are quite time consuming works for project management. At this point, tools for managing requirements help keeping specifications consistent, up-to-date and efficiently accessible. The purpose of this paper is to address the development of a new tool for requirements management with support for the evolution aspect of the grand challenges of traceability as well as making requirement specification and establishing traceability links. An approach to support the sustained evolution of traceability links is proposed and outlined. A fine-grained differencing approach on the link endpoints is used to maintain the links in a scalable manner. Details of the link model, representation and screen are given followed by the process used to evolve traceability links.
16	Code Generation for Autonomic Systems with ASSL	Emil Vassev	We describe our work on code generation of autonomic systems specified with the Autonomic System Specification Language (ASSL). First, we present a brief overview of ASSL and then we describe the process of code generation together with features of the

			generated code in terms of architecture, coding standards, base classes, and type mapping. Moreover, we demonstrate with samples how the code generated with ASSL conforms to the ASSL operational semantics. Finally, we present some experimental results of code generation with ASSL.
17	An Operational Semantics for ASSL	Emil Vassev	This paper presents an operational semantics for ASSL (Autonomic System Specification Language). ASSL is a promising new formal language dedicated to the development of systems exploiting the benefits of autonomic computing, a highly-regarded technique in the development of self-managing complex systems which draws inspiration from the mammalian autonomic nervous system. With the semantics definitions presented here, we attempt to provide an explicit model of the ASSL formal language by attaching an explicit meaning to every ASSL construct.
18	Access List based VLAN Map Architecture and Modified 802.1q Frame Scheme for Addressing VTP Issues	HARTINDER JOHAL	Cisco's VLAN Trunk Protocol reduces administration in a switched network. Not much research has been pursued in addressing in-depth complexities of VTP. VTP encounters intricate situations first, when we try to insert a VTP client or server with higher config revision number and second, when we insert a switch with different VTP domain name. Solutions to both of these issues involve considerable manual re-configuration which transcends from manually changing VTP modes, domain names to manually adding missing or deleting un-wanted VLANs. Amount of manual configuration cited as obvious solution to these VTP problems increases exponentially for a mid-size scalable switched network and moreover this might also add to network downtime and subsequently to network management cost. This paper explores the probability of eliminating manual configuration by comprehensively automating the applicability of proposed innovative solutions when VTP encounters above specified issues. An access list based VLAN map architecture is proposed for addressing the first issue. Modification in 802.1q frame is proposed to address the second concern of inserting switch with different VTP domain. Comprehensive analysis of simulated network is pursued to demonstrate the repercussions of VTP issues and finally, applicability of proposed architectures are introspected as viable way-out.

20	Functional requirement improvements through size measurement: a case study with inexperienced measurers	Sylvie Trudel and Alain Abran	This paper reports on a research project investigating the contribution of functional size measurers to finding defects in requirements. It describes an experiment where the same requirements document was inspected by a number of inspectors, as well as by a number of measurers. All participants had limited experience in both inspecting and measuring. The number and types of defects found by the two groups are compared and discussed. For this experiment, the measurers used COSMIC – ISO 19761 to measure functional size and to find defects. Results show an increase in defect identification when both inspection and functional size measurement are used to find and report defects.
21	Remote Automated User Testing: First Steps toward a General-Purpose Tool	Chandan Sarkar and Candace Soderston	In this paper we explore options for conducting remote, unattended usability tests to enable users to participate in these tests in their own environments and time zones. This option also supports multiple users' to participate in these usability tests at the same time. We developed a general purpose tool name "Total Cost of Administration" (TCA) to catalog and analyze database administrators' behavior within software development phase, employing this through remote unattended usability study. In this paper, we present our findings from the data collected over a period of 6 months. Through the tool and data provided, we are able to analyze users' behavior-interaction with the software, including deviations from the best path, in addition to collecting traditional measures such as time on task, error rate, users' perceptions and satisfaction level. Further, we explore how the this type of tool offers a promising approach for conducting guided step-by-step ideal best-path benchmark studies for best performance, assuming error-free, expert user behavior.
22	Stepwise design of BPEL web services compositions an Event B refinement based approach	Idir AIT-SADOUNE and Yamine AIT-AMEUR	Several web services compositions languages and standards are used to describe different applications available over the web. These languages are essentially syntactic ones, their descriptions remain informal and are based on graphical notations. They do not offer any guarantee that the described services achieve the goals they have been designed for. The objective of this paper is twofold. First, it focuses on the formal description, modelling and validation of web services compositions using the Event B method.

			Second, it suggest a refinement based method that encodes the BPEL models decompositions. Finally, we show that relevant properties formalized as Event B properties can be proved. A tool encoding this approach is also available.
23	Experimental study using functional size measurement in building estimation model for software project size	Nelly Condori-Fernandez , Maya Daneva, Luigi Buglione and Olga Ormandjieva	This paper reports on an experiment that investigates the predictability of software project size from software product size. The predictability research problem is analyzed at the stage of early requirements by accounting the size of functional requirements as well as the size of non-functional requirements. The experiment was carried out with 55 graduate students of Computer Science from Concordia University in Canada. In the experiment, a functional size measure and a project size measure were used in building estimation models for sets of web application development projects. The results show that project size is predictable from product size. Further replications of the experiment are, however, are planned to obtain more results to confirm our claim or disconfirm it.
24	How Do Real Options Concepts Fit in Agile Requirements Engineering?	Zornitza Racheva and Maya Daneva	Agile requirements engineering is characterized by constant re-prioritization and accommodation of changes. The requirements process is driven by creating business value for the client and it heavily involves the client in decision-making under uncertainty. Real option thinking seems to be suitable in supporting the client's decision making process at inter-iteration time. This paper investigates the fit between real option thinking and agile requirements engineering. We look into previously published experiences in the agile software engineering literature to identify (i) experience 'clusters' suggesting the ways in which real option concepts fit into the agile requirements process and (ii) experience 'gaps' and under-researched agile requirements decision-making topics which require further empirical studies. Furthermore, we conducted a cross-case study in 8 development organizations and interviewed 11 practitioners about their decision-making process. The results suggest that options are almost always considered. They are not quantified, though, but are instead explicitly or implicitly taken into consideration during the decision-making process.
25	Managing semantics	Yucong Duan,	this work aims at bound geometrical detection of 3D

	knowledge for 3D architectural reconstruction of building objects	Christophe Cruz and Christophe Nicolle	objects from a point cloud using semantic descriptors to improve reusability of architectural building reconstruction and aid automatic reasoning in building information modeling (BIM). Based on exploring cognitive origins of spatial semantics representations, semantics conceptualization and classification is proposed for formal management of 3D architectural objects. The knowledge classification composes definition, partial knowledge and ambiguous knowledge, and is formalized with transformations among closed world assumption (CWA) and open world assumption (OWA). Systemic case study is conducted on a simplified building prototype complying with the IFC standard. The organization of empirical knowledge rules is revealed, and semantics scopes are addressed both in the bottom up manner of geometry topology semantics, and a vice versa top down manner. Partial experiments are conducted in the form of intermediate analysis models during the knowledge modeling process, and initial reasoning demonstrations on the platform of protégé with semantic web rule language (SWRL) rules. This work is promising towards meeting optimization requirement which demands the integration of what users want, what theorists believe possible and what practitioners think practical.
27	A Generic Model for the Specification of Software Interface Requirements and to Measure their Functional Size	Khalid Al-Sarayreh and Alain Abran	The European ECSS-E-40 series of standards for the aerospace industry includes interfaces as one of 16 types of non functional requirement (NFR) for embedded and real-time software. An interface is typically described at the system level as a non functional requirement, and a number of concepts and terms are provided in that series to describe various types of candidate interfaces. This paper collects and organizes these interface-related descriptions into a generic model for the specification of software interfaces and requirements, and to measure their functional size for estimation purposes using the COSMIC ISO 19761 standard.
28	Modeling and Validating Requirements using Executable Contracts and Scenarios	David Arnold, Jean-Pierre Corriveau and Wei Shi	A quality-driven approach to software development and testing demands that, ultimately, the requirements of stakeholders be validated against the actual behavior of an implementation under test (IUT). In Model-Based Testing, much work has been done on the generation of functional test cases. But few approaches tackle the

			executability of such test cases. And those that do, offer a solution in which tests and test cases are not directly traceable back to the actual behavior of an IUT. Furthermore, very few approaches tackle non-functional requirements. Consequently, we have implemented a validation framework that does support the modeling and automated validation of a set of functional and non-functional requirements against several candidates IUTs. We report here on the key characteristics of this prototype and briefly discuss lessons learnt from its use in the context of a graduate course.
29	Repairing Service Compositions in a Changing World	Yuhong Yan, Pascal Poizat and Ludeng Zhao	One of the most important benefits of Service-Oriented Computing is to foster the satisfaction of end-user needs through the automatic generation of composite services out of simpler services existing in the user environment. Different approaches have been proposed in the last years to address this issue, e.g., based on model-checking or AI planning. Still, these approaches do not cope with the inherent dynamicity of the service pervasive world, where not only available services, but also user needs, may evolve over time. Setting up service composition in an AI planning framework, we propose in this paper repair techniques enabling service compositions to adapt at run-time, both to service and requirement changes, paving the way for on-demand and sustainable end-user service composition.
31	Comparing the Estimation Performance of the EPCU Model with the Expert Judgment Estimation Approach using Data from Industry	FRANCISCO VALDES and ALAIN ABRAN	Software project estimates are more useful when made early in the project life cycle: this implies that these estimates are to be made in a highly uncertain environment with information that is vague and incomplete. To tackle these challenges in practice, the estimation method most used at this early stage is the Expert Judgment Estimation approach. However, there are a number of problems with it, such as the fact that the expertise is specific to the people and not to the organization, and the fact that this intuitive estimation expertise is neither well described nor well understood; in addition, the expertise is difficult to assess and cannot be replicated systematically. Estimation of Projects in Contexts of Uncertainty (EPCU) is an estimation method based on fuzzy logic that mimics the way experts make estimates. This paper describes the

			experiment designed and carried out to compare the performance of the EPCU model against the Expert Judgment Estimation approach using data from industry projects.
32	A UML based deployment and management modeling for cooperative and distributed applications	Mohamed Nadhmi Miladi, Fatma Krichen, Mohamed Jmaiel and Khalil Drira	Thanks to the major evolutions in the communication technologies and in order to deal with a continuous increase in systems complexity, current applications have to cooperate to achieve a common goal. Modeling such cooperatives applications should stress regular context evolutions and increasingly users requirements. Therefore, we look for a model based solution suitable to cooperative application that can react in response to several unpredictable changes. Driven by the cooperative application structure, we propose, in this paper, an UML extension named “DM profile” ensuring a high-level description for modeling the deployment and its management in distributed application. The proposed contribution is validated through a Follow Me case study and implemented through an Eclipse plug-in.
33	Representing Unique Stakeholder Perspectives in BPM Notations	Carlos Monsalve and Alain April	Evidence shows that proposals for new modeling notations emerge and evolution of current ones are becoming more complex, often in an attempt to satisfy the many different modeling perspectives required by each stakeholder. This paper presents a method to identify the specific notation construct requirements, at multiple levels of abstraction, which satisfy the needs of a stakeholder when performing a specific task. Initially the focus is on two different stakeholders: software engineers (SE) and business analysts (BA), and one specific software engineering activity: requirements eliciting and analysis. The specific body of knowledge of the two stakeholders (Software Engineering Book of Knowledge (SWEBOK) for the SE, and Business Analysis Body of Knowledge (BABOK) for the BA) are used to identify each stakeholder specific notation construct requirements, at multiple levels of abstraction, in order to propose a simplification of their notation and constructs set. This paper presents solution avenues to simplify business process modeling notations by identifying the specific constructs preferred by different stakeholders. Keywords- business process modeling, software requirements, system requirements, representational

			analysis, levels of abstraction.
34	Cryptolysis: A Framework for Verification of Optimization Heuristics for the Automated Cryptanalysis of Classical Ciphers and Natural Language Word Segmentation	Serguei Mokhov	An earlier work on automated optimization heuristics for cryptanalysis of classical ciphers proposed a few algorithms for that task (e.g. genetic,simulated annealing, tabu search). A Java-language open-source Cryptolysis project has implemented these algorithms for verification and comparison purposes in a consistent frameworked environment allowing for additional algorithms. Another Java-language open-source project, MARF, has collected a number of frameworked classification algorithms (e.g. distance, neural network, similarity measure, etc.). We extend Cryptolysis with the wrappers for the algorithms implemented in MARF to add to the heuristics collection new results and compare them with the previously implemented algorithms. Additionally, we improve the system with the natural language word segmentation for the deciphered text corpora that lacks spacing and punctuation.
35	Analogies and differences between Machine Learning and Expert based Software Project Effort Estimation	Pablo Rodriguez-Soria, Borja Martin-Herrera, Juan Jose Cuadrado-Gallego, Miriam Martinez, Jose Javier Martinez and Dácil Castelo	This paper presents a review and comparison of the software project cost estimation methods that have emerged with more impact in recent years; Expertise and Machine Learning methods. These methods and models have been selected according to an own criteria focusing onto Analogy estimation models and Case Based Reasoning approaches, assuming that they are widely utilized by researchers and with good accurate results. Finally we show a comparative analysis of the seven models proposed inside the Machine Learning methods with advantages and disadvantages between them.
36	Process Patterns for MDA-Based Software Development	Mohsen Asadi, Naeem Esfahani and Raman Ramsin	Information systems are expected to satisfy increasingly ambitious requirements, while reducing time–to–market has become a primary objective. This trend has necessitated the advent of development approaches that are better equipped and flexible enough to cope with modern challenges. Model-Driven Architecture (MDA) and Situational Method Engineering (SME) are approaches addressing this requirement: MDA provides promising means for automating the software process, and revitalizes the role of modeling in software development; SME focuses on project-specific methodology construction, mainly through assembling reusable method fragments (process patterns) retrieved from a method base. We provide a set of high-level

			process patterns for model-driven development which have been derived from a study of six prominent MDA-based methodologies, and which form the basis for a proposed generic MDA Software Process (MDASP). These process patterns can promote situational method engineering by providing classes of common process components which can be used for assembling, tailoring, and extending MDA-based methodologies.
37	Aspect-Oriented Modeling for Representing and Integrating Security Concerns in UML	Djedjiga Mouheb, Chamseddine Talhi, Mariam Nouh, Vitor Lima, Mourad Debbabi, Lingyu Wang and Makan Pourzandi	Security is a challenging task in software engineering. Enforcing security policies should be taken care of during the early phases of the software development life cycle to more efficiently integrate security into software. Since security is a crosscutting concern that pervades the entire software, integrating security solutions at the software design level may result in the scattering and tangling of security features throughout the entire design. To address this issue, we present in this paper an aspect-oriented modeling approach for specifying and integrating security solutions into UML design models. In the proposed approach, security experts specify high-level and generic security solutions that can be later instantiated by developers, then automatically and transparently woven into UML design. Finally, we describe our prototype implemented as a plug-in in a commercial software development environment.
38	Extending the UML metamodel to provide support for crosscutting concerns	Zohreh Sharafi, Parisa Mirshams, Constantinos Constantinides and Abdelwahab Hamou-Lhadj	Aspect-orientation is an approach to explicitly capture, model and implement crosscutting concerns (aspects). It has received a relatively wide support by new programming languages or by extensions to current languages, the design dimensions of most of which has been influenced by AspectJ through three concepts and consequently by their respective constructs namely join points, pointcuts and advice which can support two principles which are recognized as being the key concepts of aspect-oriented programming: quantification and obliviousness. At the modeling level, the reception of AOP has long been focused on the modeling of AspectJ programs, and there exists no model that is generic enough to capture non-AspectJ aspects either as a target language during reverse engineering or as a source language during a forward engineering activity. In this paper, we present an

			extension to the UML metamodel to explicitly capture crosscutting concerns that is independent from any programming language and by abstracting away platform specific details. An instantiation of the newly created metamodel can be represented in standard XMI format, which enables current CASE tools to read and to visualize the instance models in UML. This language-independent aspectual description can support model transformations vital to software maintenance, such as reverse engineering, forward engineering and reengineering.
39	A New Compound Metric for Software Risk Assessment	Ahmad Hosseingholizadeh and Abdolreza Abhari	There are many different methods for software risk analysis and assessment.These methods can be categorized in 3 groups: some methods are based on business owners and developers estimation about the probability and damage of a risk; some are based on software architecture analysis (using design diagrams); and some are based on source-code analysis. Each one of these approaches has some advantages and disadvantages, but none of them cover all risky aspects of a software development. The reason to this is because from one point of view software development is a heuristic process, thus analysing the risk factor of a software product requires developers' and business owners' heuristic analysis and opinions. But from another point of view there is a high probability that these opinions contain faulty evaluations. In this paper we propose a new approach that uses a compound risk metric that is produced by combining different metrics which are obtained from all three approaches of riskm analysis. In our approach, both Risk Probability and Risk Damage are calculated using this compound technique. We calculate the architectural risk of the components based on the cyclomatic complexity of their statechart; the source-based risk is obtained by a code weight association technique with consideration of hierarchy of statements; these values are aggregated with the business owners and developers opinions to produce the risk model. We provide a case study to present the results of our approach.
40	Towards a Pattern-Based Framework for	Saeed Ahmadi Behnam, Daniel Amyot and Gunter	In organizations, a gap commonly exists between business goals and business processes. While several approaches provide modeling solutions in each of these

	Goal-Driven Business Process Modeling	Mussbacher	two areas, their relationships are often not defined well enough to be used in the software development process. This paper aims to better fill this gap through the introduction of a pattern-based framework that helps construct business processes from organization goals while maintaining traceability relationships between the two. How to extract patterns, which are composed of goal templates, process templates, and their elationships, is briefly presented. The framework, which includes a collection of patterns for a particular domain, is formalized as a profile of the User Requirements Notation, a standard modeling language that supports goals, scenarios, and links between them. A method for the use of such framework is defined and then illustrated through a case study involving an adverse event management system that targets the improvement of patient safety in healthcare organizations.
41	Towards a Tool Support for Specifying Complex Software Systems by Categorical Modeling Language	Noorulain Khurshid, Olga Ormandjieva and Stan Klasa	Formal methods are proven approaches to ensure the correct operation of complex interacting systems. However, current formal methods do not address well problems of verifying emergent behavior and evolution, which are two of the most important characteristics of complex software systems. A subset of the Category Theory has been proposed as a formal language to offer a structure,which is able to model emerging and evolving behavior of complex software. Thus, a categorical modeling language based on the category theory is proposed in this paper to specify complex systems. The approach is illustrated with a case study of Prospecting Asteroid Mission (PAM) from the NASA.
45	Process Improvement Based on Causal Networks	Reiner Dumke, Karsten Richter and Konstantina Georgieva	This paper includes a causal-based modelling of software measurement processes in order to clarify the real situations in the empirical software engineering field. A first overview about existing causal network approaches shows the problems and possible benefits using these formal techniques in the software engineering area. The definition and extension of the causal modelling using causal networks helps to understand the relationships be-tween the different software process artefacts and their causalities. The causal network based process model (CNPM) concept is based on the causal network idea of Pearl. The description of first applications of the

			CNPM approach for CMMI demonstrates the empirical reasoning of the software improvement processes in an explicit manner. Keywords: Software process improvement, causal network, process analysis and evaluation, software quality
46	L-SYNC: Larger degree clustering based time-synchronization for Wireless Sensor Network	Alireza Shameli Sendi, Masoume Jabbarifar, Hosein Pedram, Mahdi Dehghan and Michel Dagenais	In many existing synchronization protocols within wireless sensor networks, the effect of routing algorithm in synchronization precision of two remote nodes is not being considered. In several protocols such as SLTP, this issue is considered for local time estimation of a remote node. Cluster creation is according to ID technique. This technique incurs an increase in cluster overlapping and eventually routing algorithm will be affected and requires more hops to move from one cluster to another remote cluster. In this article, we present L-SYNC method, which creates large degree clusters for wireless sensor networks synchronization. Using large degree clustering, L-SYNC can reduce path hops. Also, L-SYNC uses linear regression method to calculate clock offset and skew in each cluster. Therefore, it is capable to compute skew and offset intervals between each node and its head cluster and, in other words, it can estimate the local time of remote nodes in future and past. To estimate the local time for remote node, routing algorithm is used and conversion technique is performed in each time changing hops. The fewer L-SYNC hops could increase the precision. Simulation results illustrate that monotonous clustering formation can increase the precision in synchronization. However, more overhead and time period is needed for clustering formation.
47	Service-oriented Measurement Infrastructure	Reiner Dumke, Robert Neumann, martin.kunz Kunz and A Schmietendorf1	The paradigm of service-oriented solutions (e.g. as SaaS) in the area of quality assurance seems to be a flexible innovative solution in order to support different high dynamic requirements in software measurement and evaluation. Otherwise many existing solutions are used in practice and must be migrated to such powerful infrastructures. This paper describes a general approach as service-oriented measurement infrastructure and shows a first practical solution as an example of flexible worldwide useable quality assurance application that is available in the Web. Keywords: Software measurement, Software quality, Metrics repositories,

			SaaS
48	Towards Automated Monitoring and Forecasting of Probabilistic Quality Properties in Open Source Software (OSS): A Striking Hybrid Approach	Reza Meimandi Parizi and Abdul Azim Abdul Ghani	In this paper, we propose a hybrid approach based on the aspect-orientation methodology and time series analysis to the runtime monitoring and quality forecasting of OSS. Specifically, the major objective of this work is to combine the idea of time series analysis with the area of software quality assurance of OSS in which statistical techniques for analyzing of time series is used to facilitate the prediction and forecasting (the term 'prediction' and 'forecasting' are interchangeably used in the literature) of probabilistic quality properties, which are difficult or inapplicable to be evaluated by current approaches such as testing, and also help to increase the reliability and productivity of working OSS system components (towards trustworthy OSSD) requiring extreme runtime quality control. Furthermore, in order to reduce the human effort and to cope with more sophisticated scenarios, this study also aims to automate the analysis and modeling process by providing appropriate tool.
49	Statistical Techniques Applicability during SDLC for Software Quality: Overview and Future Vision	Manar Abu Talib, Adel Khelifi, Alain Abran and Olga Ormandjieva	Lack of a suitable set of controls during the development lifecycle of the software will lead to mistakes in the requirements, the design or code of software and therefore results in a software that does not meet the quality requirements. Statistical techniques can be a great source of control towards software quality. This paper investigates the use of statistical techniques for software quality and their applicability during the Software Development Life Cycle (SDLC). It introduces an overview of statistical techniques such as the seven basic tools of quality, Statistical Process Control and the Six Sigma. It also explores how these statistical techniques can be used for managing and controlling the quality of software during specification, design, implementation, testing and maintenance and they are generally accepted for most of the projects, most of the time, and with value recognized by SWEBOK Guide. Paper Category: Software Quality
50	An Empirical Study of Fan-in and Fan-out in Java OSS	Emal Nasseri,, Steve Counsell and Ewan Tempero	Coupling is a well researched topic in the Object-Oriented (OO) research community and its influence on class cohesion is well understood. In this paper, we present an empirical study exploring the effect of method calling on class cohesion using two

			coupling metrics, namely fan-in and fan-out. Three Java, open-source systems (OSS) were used as a basis of the study. A small number of classes were found to account for the vast majority of fan-in and fan-out. We also found the impact of fan-out on class cohesion to be higher than that of fan-in. Classes containing fan-out tended to have lower cohesion than those containing fan-in.
51	Autonomic View of Query Optimizers in Database Management Systems	Basit Raza	The growing complexity of applications, huge data volume and the data structures to process massive data are becoming challenging issue. Query optimizer is a major component of a Database Management System (DBMS) that executes queries through different strategies and techniques efficiently. These techniques select the best optimal execution plan from the candidate plans according to the available resources and environment. Traditionally, skilled database administrators are required to tune DBMS for efficient query processing. Recently it has been realized to develop DBMSs having autonomic capabilities. Autonomic DBMS (ADBMS) are now being developed to reduce this dependency on an expensive skilled human resource. The paper analyzes the autonomic capabilities of query optimizers in three well-known DBMSs – DB2, Oracle and SQL Server being used in the industry. The research is focused to find and earmark those areas in query optimizers where the human intervention is required. Query Optimizers are compares with their autonomic capabilities; explores their strengths and weaknesses; and provides the basis for improving the current state of autonomic computing in query optimizers. The autonomic behavior of query optimizers is observed by designing and executing different queries through experiments and some recommendations are given
52	Investigation of the Capability of XP to Support the Requirements of ISO 9001 Software Process Certification.	Malik Qasaimeh and Alain Abran	For software organizations needing ISO 9001 certification, it is important to establish a software process life cycle that can manage the requirements imposed by this certification standard. This paper presents an analysis of extreme programming (XP) from the ISO 9001 and ISO 90003 perspectives. The focus is to extract the requirements related to the ISO product realization process and to determine the strengths and weaknesses of XP in handling those

			requirements.
53	Toward a Business Model for Software Product Line Architecture	Mohammad Tanhaei, Shahrouz Moaven, Jafar Habibi and Hamed Ahmadi	Nowadays, software product line is an approach to reduce costs of software development, decrease time to market, and increase capabilities of reuse in designing and exploiting software development processes. Moreover, other quality attributes of the project domain should be considered to enhance quality of the product. Meanwhile, taking advantage of software product line makes developers capable of estimating development costs and time to market in a more realistic way. However, old approaches to estimate cost of development and foresee time to market are not suitable enough for software product line.In this paper, some important business parameters and a way to calculate cost and time to market in a product line is presented. Changing components among time, portion of the change in a specific product and organization issues are observed in the estimation function. Category: Software Product Line
54	Cross Engine Database Joining	Wesley Leonard and Paul Albee	A standards-based, open-source middleware system was designed and implemented to facilitate the analysis of large and disparate datasets. This system makes it possible to access several different types of database servers simultaneously, browse remote data, combine datasets, and join tables from remote databases independent of vendor. The system uses an algorithm known as Dynamic Merge Cache to handle data caching, query generation, transformations, and joining with minimal operational interference to source databases. The system is able to combine any subset of configured databases and convert the information into XML. The resulting XML is made available to analysis tools through a web service. After the system connects to a remote database, a metadata catalog is created from the source database. The user is able to configure which tables and fields to export from the remote dataset. The user is also able to filter, transform, and combine data. The system was tested with a large fish contaminant database and a second database populated with simulated scientific data.
56	A Survey on the Importance of Some Economic Factors in the Adoption of Open	Vieri Del Bianco, Luigi Lavazza, Sandro Morasca, Davide Taibi and	Economic advantages have long been used as a key factor for promoting the adoption of Open Source Software. This paper reports on an investigation about the impact of economic factors when deciding on the

	Source Software	Davide Tosi	adoption of Open Source Software, in the framework of a survey carried out in the QualiPSo project. The results seem to indicate that economic issues may have a remarkably lower impact than commonly believed, though people with roles more directly related to economic results and working in private companies seem to give economic factors more consideration than other Open Source Software stakeholders.
57	On Formal Modeling of TOPPERS Embedded Software	Yoshinobu Kawabe, Nobuhiro Ito and Naohiro Ishii	Today embedded software is widely used. As the complexity of embedded systems grows, the number of tasks performed by embedded software is increasing. These tasks must communicate with each other to achieve synchronization. And therefore, the growing complexity of communications is making it increasingly difficult to program and debug these tasks. To confirm the correctness of embedded software, this paper introduces a formal specification language for embedded systems that can deal with their concurrent nature. After formalizing the APIs of an embedded real-time operating system, we demonstrate how to describe and verify embedded software formally.
58	Flexible Flow Shop Scheduling by Intelligent Multi-Agents	Wei Weng and Shigeru Fujimura	This paper is an improved version of a previously proposed intelligent production system dealing with dynamic flexible flow shop scheduling problem under a multi-stage multi-machine environment. The aim of this research is to upgrade the overall system performance under a wide range of demand fluctuations, to build the system robust against pressuring demand increase, and to test the system under machine breakdown situations. The objective is to minimize the total earliness and tardiness penalties of all jobs during any given period of time. The system works on the basis of multi-agent feedbacks and feedforwards. The agents collect realtime information, make decisions, and work interactively to give corresponding solutions to each job under the changing system conditions. Comparison between the original system and the improved system has been conducted, and the experimental results demonstrate the robustness of the new system under all kinds of situations.
60	Privacy Protection Mechanisms for the Web Service Technology	Diego Garcia	The successful use of the Web service technology in areas such as healthcare and government depends on its privacy preservation support. As there is no privacy standard for Web services currently, several solutions

			have been proposed in the literature to deal with privacy in Web services recently. However, there is no solution that provides a suitable mechanism to describe privacy properties in Web services. When loosely-coupled components are involved, such as in Web service environments, a rich description of components is needed to determine whether they can interact in a manner that preserves privacy. The goal of this paper is to propose an approach that combines Web Services Policy Framework (WS-Policy) policies and a Web Ontology Language (OWL) ontology to support Web service interactions with suitable privacy levels. The main contribution of this paper is an ontology that enables rich specification and intersection of privacy policies for Web services.
61	Using the General Intensional Programming System (GIPSY) for Evaluation of Higher-Order Intensional Logic (HOIL) Expressions	Serguei Mokhov and Joey Paquet	The General Intensional Programming System (GIPSY) has been built around the Lucid family of intensional programming languages that rely on the higher-order intensional logic (HOIL) to provide context-oriented multidimensional reasoning of intensional expressions. HOIL combines functional programming with various intensional logics to allow explicit context expressions to be evaluated as first-class values that can be passed as parameters to functions and return as results with an appropriate set of operators defined on contexts. GIPSY's frameworks are implemented in Java as a collection of replaceable components for the compilers of various Lucid dialects and the demand-driven eductive evaluation engine that can run distributively. GIPSY provides support for hybrid programming models that couple intensional and imperative languages for a variety of needs. Explicit context expressions limit the scope of evaluation of math expressions (effectively a Lucid program is a mathematics or physics expression constrained by the context) in tensor physics, regular math in multiple dimensions, etc., and for cyberforensic reasoning as one of the use-cases of interest. Thus, GIPSY is a support testbed for HOIL-based languages some of which enable such reasoning, as in formal cyberforensic case analysis with event reconstruction. In this paper we discuss the GIPSY architecture, its evaluation engine and example use-cases.
62	Object-Oriented	Aihua Wu, Joey	This article introduces Object-Oriented Intensional

	Intensional Programming: Intensional Classes Using Java and Lucid	Paquet and Serguei Mokhov	Programming (OO-IP), a new hybrid language between Object-Oriented and Intensional Programming Languages in the sense of the latest evolutions of Lucid. This new hybrid language combines the essential characteristics of Lucid and Java, and introduces the notion of object streams which makes it is possible that each element in a Lucid stream to be an object with embedded intensional properties. Interestingly, this hybrid language also brings to Java objects the power to explicitly express and manipulate the notion of context, creating the novel concept of intensional object, i.e. objects whose evaluation is context-dependent, which are here demonstrated to be translatable into standard objects. By this new approach, we extend the use and meaning of the notion of intensional objects and enrich the meaning of object streams in Lucid and semantics of intensional objects in Java.
63	Advances in the Design and Implementation of a Multi-Tier Architecture in the GIPSY Environment with Java	Bin Han, Serguei Mokhov and Joey Paquet	We present advances in the software engineering design and implementation of the multi-tier run-time system for the General Intensional Programming System (GIPSY) by further unifying the distributed technologies used to implement the Demand Migration Framework (DMF) in order to streamline distributed execution of hybrid intensional-imperative programs using Java.
64	A Type System for Higher-Order Intensional Logic Support for Variable Bindings in Hybrid Intensional-Imperative Programs in GIPSY	Serguei Mokhov and Joey Paquet	We describe a type system for a platform called the General Intensional Programming System (GIPSY), designed to support intensional programming languages built upon intensional logic and their imperative counter-parts for the intensional execution model. In GIPSY, the type system glues the static and dynamic typing between intensional and imperative languages in its compiler and run-time environments to support the intensional evaluation of expressions written in various dialects of the intensional programming language Lucid. The intensionality makes expressions to explicitly take into the account a multidimensional context of evaluation with the context being a first-class value that serves a number of applications that need the notion of context to proceed. We describe and discuss the properties of such a type system and the related type theory as well as particularities of the semantics, design and

			implementation of the GIPSY type system.
65	Verification of the Correctness in Composed UML Behavioural Diagrams	Samir Ouchani, Otmane Ait Mohamed, Mourad Debbabi and Makan Pourzandi	The Unified Modeling Language UML 2.0 plays a central role in modern software engineering, and it is considered as the de facto standard for modeling software architectures and designs. Today's systems are becoming more and more complex, and very difficult to deal with. The main difficulty arises from the different ways in modelling each component and the way they interact with each others. At this level of software modeling, providing methods and tools that allow early detection of errors is mandatory.In this paper, a verification methodology of a composition of UML behavioural diagrams (State Machine, Activity Diagram, and Sequence Diagram) is proposed. Our main contribution is the systematic construction of a semantic model based on a novel composition operator. This operator provides an elegant way to define the combination of different kind of UML diagrams. In addition, this operator posses a nice property which allows to handle the verification of large system efficiently. To demonstrate the effectiveness of our approach, a case study is presented.
66	Applying a Feedforward Neural Network for Predicting Software Development Effort of Short-scale Projects	Cuauhtemoc Lopez-Martin and Ivica Kalichanin-Balich	The software project effort estimation is an important aspect of software engineering practices. The improvement in accuracy and precision of estimations is a topic that still remains as one of the greatest challenges of software engineering and computer science in general. In this work, the effort estimation for short-scale software projects, developed in academic setting, is modeled by two techniques: statistical regression and neural network. Two groups of software projects were made. One group of projects was used to calculate linear regression parameters and to train a neural network. The two models were then compared on both groups, the one used for their calculation and the other that was not used before. The accuracy of estimates was measured by using the magnitude of error relative to the estimate (MER) for each project and its mean MMER over each group of projects. The hypothesis accepted in this paper suggested that a feedforward neural network could be used for predicting short-scale software projects.
69	An Approach for Detecting Execution	Akanksha Agarwal, Heidar Pirzadeh	Understanding the behavioural aspects of a software system is an important activity in many software

	Phases of a System for the Purpose of Program Comprehension	and Abdelwahab Hamou-Lhadj	engineering activities including program comprehension and reverse engineering. The behaviour of software is typically represented in the form of execution traces. Traces, however, tend to be considerably large which makes analyzing their content a complex task. There is a need for trace simplification techniques that can help software engineers make sense of the content of a trace despite the trace being massive. In this paper, we present a novel algorithm that aims to simplify the analysis of a large trace by detecting the execution phases that compose it. An example of a phase could be an initialization phase, a specific computation, etc. Our algorithm processes a trace generated from running the program under study and divides it into phases that can be later used by software engineers to understand where and why a particular computation appears. We also show the effectiveness of our approach through a case study.
70	A New Algorithm based on Incentive Design in E-Commerce Systems	Koki Murakata and Tokuro Matsuo	In recent years, the Internet-based commerce has been widely developing with enhancement convenience of trading on the web. On the other hands, a lot of troubles on trading also increase. This paper proposes a new evaluation mechanism to decrease the information incompleteness and asymmetry by using multi-attribute evaluation. Buyers can evaluate due to the multiple criteria chosen by sellers. Based on the number of criteria, the system determines the incentive rate of synthetic rating for sellers. Thus, they have an incentive to disclose evaluated items for buyers. Further, buyers can know a lot of information without information darkness. Advantages of our proposed model include incomplete and asymmetric information decreases on the e-commerce site.
71	Investigating the Capability of Agile Processes to Support Life-Science Regulations: The Case of XP and FDA Medical Devices' Software	Hossein Mehrfard, Heidar Pirzadeh and Abdelwahab Hamou-Lhadj	Recently, there has been a noticeable increase of attention to regulatory compliance. This increase is due by many factors including the recent corporate scandals of some of the major organization in the U.S., the need to protect and secure sensitive information due to the reliance on Information Technology (IT), the shift towards a global market, and so on. As a result, more and more organizations are required to comply with the laws and regulations that apply to their industry sector. An important aspect of these regulations is directly related to the way by which software systems, used by

			regulated companies, are built, tested, and maintained. While some of these regulations require from these systems to support a very specific set of requirements, others, the focus of this paper, are concerned with the process by which the system has been built. The Food and Drug Administration (FDA) regulations, for example, impose stringent requirements on the process by which software systems used in medical devices are developed. These requirements translate into various software artifacts that must be made available for the software to be FDA-compliant. In this paper, we discuss these requirements in detail and show how XP lacks the necessary practices to support these requirements. To address this issue, we propose an extension to XP, that if adopted, we believe it will allow organizations to profit from both worlds of agility and auditability.
73	Development of Location-Based Systems with Components	Haeng-Kon Kim and Sun-Myung Hwang	ABSTRACT- The proxy driving service is having a boom recently, which a proxy driver on behalf of a drunken one has a car to the destination at night. The call center selects the nearest proxy driver based on the distance from the customer and sends customer's information to the designated one. A proxy driver usually speaks to the customer and moves to the target location. But if a customer cannot explain his current location correctly or a proxy driver is not familiar with that position, a proxy driver cannot get to the customer quickly and the customer tends to be unsatisfied with the service. So the need for a system that provides proxy drivers with location information about customers and destination is rapidly increasing. This paper shows the design and implementation of proxy driving service system using a location-based service. The experiment shows that the implemented system can provide efficient services to the customers and proxy drivers than existing systems.
75	The Software Modeling and Implementation of Reliable Server Pooling and RSPLIB	Xing Zhou, Thomas Dreibholz, Martin Becke, Jobin Pulinthanath, Erwin P. Rathgeb and Wencai Du	With the growing complexity of software applications, there is an increasing demand for solutions to distribute workload into server pools. Grid Computing provides powerful -- but also highly complex -- mechanisms to realize such tasks. Also, there is a steadily growing number of downtime-critical applications, requiring redundant servers to ensure service availability in case of component failures. To cope with the demand for server redundancy and service availability, the IETF

			has recently standardized the lightweight Reliable Server Pooling (RSerPool) framework, which is a common architecture for server pool and session management. In this paper, we first introduce the concept of RSerPool and then present the modeling thoughts of RSPLIB and the underlying general groupware design. Based on RSPLIB, we will illustratively show how to easily develop applications on top of RSerPool. We will also offer an application evaluation example for a proof of concept setup to distribute ray-tracing computation workload into a compute pool. Keywords: Reliable Server Pooling, RSPLIB, Service Availability, Software Modeling, Implementation
86	Study of one dimensional molecular properties using Python	Eric Famutimi, Micheal Stinson and Roger Lee	One of the attractions to the study of one dimensional systems is the technological interest of their possible effects in nanoelectronics [1]. There are myriads or papers on the solution to the problem of the electronic properties of one dimensional systems. Few of these papers use python for visualization but none has used python as a tool for solving this problem from first principle. In this paper, we present several techniques of using Python as a tool in computational analysis. We report the results of using python to study the electronic properties of an infinite linear chain of atoms. We use the principles of nearest neighbor and directly calculated the eigenvalues of our system. We also derived the green function for the system and compared the eigenvalues obtained from the green function with those directly calculated. Visualization of our results was achieved using Matplotlib, a powerful yet,easy to use Python plotting library. Our results show an agreement between the eigenvalues obtained by direct calculation and those obtained using our derived green function for the system. The results also show the simplicity of Python as an analytical tool in computational sciences.
87	Development of Mobile Agent on CBD	Haeng-Kon Kim and Sun Myung Hwang	Mobile device has been considered a key technology for embedded software and biquitous era. Because, existing web environments is moving to wireless internet, the new concepts for wireless internet computing environments has gained increasing interest. Mobile agent provides a new abstraction for deploying functional over the existing infrastructures.

			Mobile application systems requires the flexibility, adaptability, extensibility, and autonomous. A main nature of ad hoc mobile networks is frequent change on their topology that is the source of many problems to be solved. AODV is an on-demand routing protocol for decreasing maintenance overhead on ad hoc networks. But some path breaks can cause significant overhead and transmission delays. If the maintenance overhead of routing table can be reduced, table-driven routing methods could be an efficient substitution. In this paper, we propose a knowledge discovery agent for an effective routing method that is using the simple bit-map topology information. The agent node gathers topology knowledge and creates topology bit-map information. All paths for source to destination can easily be calculated by the bit-map. All the other nodes on the network maintain the bit-map distributed from agent and uses it for source of routing. Correctness and performance of the proposed agent method is verified by computer simulations. Keywords: Component Based Development, Mobile Agent, Agent Classification, knowledge discovery agent, Ad hoc networks