

Track Descriptions for COMPSAC 2013

1. Internet Architecture and Applications

The flexibility and robustness offered by the Internet has caused its rapid growth as part of the communication infrastructure that underpins the daily activities of most humans – it is a key enabler of the expanding sphere of computing. Despite (and due to) this rapid growth and critical role, much room for improvement exists in technologies and applications for the Internet. These unsolved problems are the focus of the **Internet Architecture and Applications Track**. Topics of particular interest to this track include, but are not limited to **network and protocol architectures, content delivery and management, collaboration technologies, and applications**.

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2. Network Security

The growing importance and impact of networks, software, and data has led to an increase in the number and sophistication of targeted attacks. The **Network Security Track** welcomes original papers that analyze these vulnerabilities, attack methodologies, and protective measures for networks. The topics of interest include, but are not limited to **detection and prevention of attacks, forensics, network malware analysis, protection of personal information, and the legalities and ethics associated with network security policies**.

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3. Network Middleware, Cloud Architecture, and Computing

The importance of middleware stacks cannot be overstressed. They provide openness, flexibility, and many other attributes important and desirable to software engineering. The architecture of network services and clouds, respectively; is typically discussed in terms of the underlying middleware stack. Moreover, many components of software-oriented architectures are extracted in the form of a middleware layer from services in distributed environments. Topics of interest to the **Network Middleware, Cloud Architecture, and Computing Track** include, but are not limited to **middleware stack architectures; cloud architectures; authentication, authorization, accounting**

and access management; wireless network roaming architectures; federations and trust fabrics (technologies and policies); and management of distributed systems and services.

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4. Machine-to-Machine (M2M) Networking and Internet of Things

Advances in wireless network technology have facilitated the connection of devices such as vehicles, sensors, smartphones, and electric household appliances, to each other and/or to the Internet. Noteworthy challenges arising from the ubiquity of these devices include frequent and often significant changes to the topology of the resulting networks. The focus of the **Machine-to-Machine (M2M) Networking and Internet of Things Track** is on investigating and developing novel network communication paradigms capable of addressing the unique challenges involved. Topics of interest include, but are not limited to: **Vehicle-to-Vehicle (V2V) communications, geographical communication, sensor networks, distributed and stream processing, publish/subscribe systems, and service platforms.**

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5. Software Life Cycle, Evolution, and Maintenance

The increasingly important role of software in applications critical to daily life necessitates that a) applications be designed to allow the continual updates required to keep them functional and useful, and b) legacy software systems be kept abreast of dynamic and evolving specifications. Both requirements constitute the two-fold focus of the **Software Life Cycle, Evolution, and Maintenance Track**. Topics of interest include, but are not limited to **design for evolution, subscribe-and-push systems for software update, software rejuvenation, and maintainability.**

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6. Requirements Engineering

Requirements engineering (RE) is a discipline of descriptions, which has branched out from systems and software engineering research. The focus of the discipline, and hence the **Requirements Engineering Track**, is on sound and systematic **methods for identifying, representing, validating, and communicating the requirements of various applications**; to be utilized in software system design, implementation, evolution and reuse. Of particular interest to this track is **RE for emerging applications where software and data play the major roles**.

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7. Formal Methods

The discipline of formal methods is centered on mathematically-rigorous tools and techniques for the specification, design, verification, and validation of software systems and their data. As the scope, breadth, complexity, and importance of software systems and data increase; the mathematical rigor offered by formal methods becomes invaluable to system and information assurance. Topics of interest to the **Formal Methods Track** include, but are not limited to **formal methods for different programming paradigms and different object and component systems, model-based development and generation of code, lightweight tools based on formal methods, and the formal foundations of various development methodologies**.

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8. Software Architecture and Design

The focus of the **Software Architecture and Design Track** is on the challenges and problems associated with all aspects of the architecture and design of complex software systems and applications. Topics of interest include, but are not restricted to **software architecture and quality attributes; architecture reengineering and recovery; architecture conformance and run-time monitoring; architecture-based solutions for different types of systems (long-lived, cloud computing, SOA, component-based systems); architecture description languages and model-driven architecture; and analysis, modeling, validation and verification, and business and managerial aspects of software architecture**.

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9. Software Testing

Costs entailed by software failures demonstrate that the systematic development of software of attaining acceptable dependability is still a challenge, even after decades of research. The costs of software failures are especially high for safety-critical systems, whose dependability and security are of the utmost importance. Increasingly, however; the costs of failures for non-safety-critical systems have been of growing concern, due to the expanding sphere of such systems. Software testing still remains the most popular means to detect failures. Topics of interest to the **Software Testing Track** include, but are not limited to: **testing and reliability, static and dynamic testing techniques, testing measures and their quantification, techniques and tools for automated testing, and controlled experiments and empirical studies.**

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10. Reliability, Metrics, and Fault-Tolerance

For the continually-increasing number of systems that rely on software applications (and the data they produce); reliability, availability, quality, and safety are important to achieving dependable operation – they directly or indirectly reflect how well failures are being prevented. Should a failure inevitably occur, fault-tolerance, survivability, and resilience become crucial for continued operation of the system. Metrics and measurement techniques are necessary to assess, estimate, or predict these aspects of software dependability and quality. To this end, the **Reliability, Fault-Tolerance, and Metrics Track** solicits papers on topics that include; but are not limited to **tools and techniques for analysis, modeling, and simulation of software systems; design methodologies for achieving dependable operation for these systems, quantitative and qualitative metrics for related non-functional attributes of a system, and measurement and assessment techniques for populating these metrics.**

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11. Trust and Privacy

A direct consequence of the rapid increase in electronic communication, surveillance, and collection of data for analytics is concerns about trust (authentication) and aspects of security such as confidentiality and privacy. The vast amounts of data collected by independent means about an individual poses a challenge to confidentiality of the data and anonymity of the individual. The **Trust and Privacy Track** invites research papers and experience reports on **various software application systems where issues related to the security, trust, and privacy of systems and data have been addressed**. Related topics include the **specification of related requirements, the assessment of whether these requirements have been met, and tools and methods for implementation and verification of policies and techniques crucial to achieving trust and privacy**.

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12. Human-Computer Interaction (HCI) and Usability

The goal of the **HCI and Usability Track** will be to enable the exchange of experiences related to the multi-disciplinary areas of HCI and Usability; including but not limited to the following topics: **ambient intelligence, domotics, smart environments, multimodal interaction, multimedia systems, speech and dialogue systems, usability evaluation, intelligent interactive devices, information accessibility, HCI for the handicapped, and user and group modeling**.

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13. Real-Time and Embedded Systems

An embedded system is an application-specific electronic subsystem used in a larger entity such as an appliance, an instrument, or a vehicle. The embedded system may embody the complete system functionality in several different ways - using software running on CPUs or in specialized hardware accelerators. In order to meet performance requirements, these hardware-software interfaces need to be jointly designed. This requires a new type of engineer, who combines knowledge in both hardware and software. Moreover, real-time issues pose a significant technical challenge to many real-time systems. The **Real-Time and Embedded Systems Track** invites papers that **address issues related to real-time or embedded systems, at system designer and/or user levels**.

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14. Mobile and Pervasive Computing

The **Mobile and Pervasive Computing Track** is a forum for researchers, practitioners, and educators to present recent findings, innovations, theories, ideas and experiences in all topics related to mobile & pervasive/ubiquitous computing. Topics of interest to this track include, but are not limited to **enabling technologies such as mobile positioning, wireless networks, smart devices, and sensing and interaction; system considerations such as scalability, security and privacy; software architecture issues such as pervasive computing middleware and programming models; and applications such as mobile services, context-aware applications and mobile social networks.**

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15. Semantic Web

The **Semantic Web Track** invites researchers, practitioners, and educators to present recent findings, innovations, theories, experiences, and ideas in all topics related to methods and enabling technologies to allow man, machine, and software to understand the semantics of application data (such as Web data), in order to be able to automatically integrate data from different sources, to perform actions on behalf of the user, and to search for information based on its meaning rather than its syntactic form.

Topics of interest include, but are not limited to **models, formats, notations, tools, and technologies intended to provide a formal description of concepts, terms, and relationships within a given knowledge domain; technologies enabling people creating data stores on the Web, building vocabularies; and using ontologies and rules for handling linked data.** Papers are invited on **all aspects of linked data, vocabularies, ontology, query, inference, and vertical applications of semantic web technology.**

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16. Web Services and Business Process Management

The **Web Services and Business Process Management Track** brings together academia and industry to explore all aspects of the systems and services enabled by the Web. The goal of this track is to deepen the understanding of, foster innovation in, and define the future of **Web-based systems, Web services, and Web engineering by sharing the latest findings, ideas, and experiences in Web-related areas**. We encourage the submission of **experience papers that highlight findings gained through real-life development projects**, research papers that present **experimental efforts or innovative systems**, and **investigations that identify weaknesses in the existing Web practices**.

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17. Education, Learning, and Discourse

The focus of the **Education, Learning, and Discourse Track** is on the educational underpinnings that are needed to support the creation, understanding, and use of software and data. The expanding sphere of software and data necessitates discourse that extends this education beyond disciplinary boundaries - life and social sciences, respectively, are only examples of disciplines with increasing ties to and benefits for computing-related disciplines. Topics of interest to this track include **education areas such as related curricula and course offerings, use of educational IDEs early in the curricula, educational experience reports, case studies, professional certification, outsourcing/international issues, and industry/university collaboration**.

Track Chairs:

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18. Social Networks and Crowd Sourcing

The **Social Networks and Crowd Sourcing** track invites researchers, entrepreneurs, and educators to present and discuss novel approaches, experiences, and ideas related to **centralized and decentralized online social networks**, as well as **crowdsourcing**. Topics of interest include, but are not limited to **applications, concepts and architectures for social networks and crowdsourcing**; and **network analysis and metrics, protocols and data handling, privacy, decentralized social networks, local communities, and business models for social networks and crowdsourcing**.

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19. Big Data Analytics and Knowledge Management

Big Data refers to data sets that are so massive and dynamic that current tools are inadequate for their capture, storage, management, and analysis. Many analysts characterize Big Data by “four Vs”: volume, variety, velocity, and veracity. Variability and visibility are recent additions to these characteristics. The focus of the **Big Data Track** is to explore **new algorithms, ideas, and opportunities in the analysis and management of Big Data – with the goal of keeping abreast of the continual increase in the volume and complexity of data sets and enabling discovery of information and value that may be hidden from less sophisticated analysis.**

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20. e-Health and Well-Being

Software and data are increasingly being used to achieve “e-Health” and well-being, whose goal goes beyond disease prevention to **the fostering of mental and physical fitness of individuals and populations through the use of computing technology.** Application areas include stress and relaxation, health consumption, physical activity, sleep quality, and social interaction. In the quest for well-being through e-Health, the role of software and data (or more broadly, computer science) is to facilitate **unobtrusive monitoring, data fusion, smart reasoning, efficacy of coaching strategies,** and **scaling and automation for compliance with national and international regulations.** **The e-Health and Well-Being Track solicits papers related to any aspect of these emerging efforts.**

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21. Digital Cities and Public Places

The creation of digital cities and public places has led to new challenges in security, environmental engineering, transportation, water distribution; and more broadly, resource management and allocation. **Real-time collection and broadcast of data on resources such as water** can help in **determining and visualizing the dynamics of the area** and can alleviate problems commonly faced in resource allocation for large urban (and even many rural) areas. Computing technology can be invaluable; e.g., in **facilitating the participation of citizens in democratic decision-making for the evolution of a city**, or **simplifying and streamlining the execution of actions that improve the quality of life of citizens without sacrificing sustainability**. **The Digital Cities and Public Places Track solicits papers that document, propose, or analyze related efforts.**

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