Call for Technical Papers ICAC 2019

The 16th IEEE International Conference on Autonomic Computing (ICAC)
http://icac2019.cs.umu.se/
https://icac19.hotcrp.com/

IMPORTANT DATES

Abstract and Paper Submission	**Feb 01, 2019**
Paper Submission Deadline	**Feb 08, 2019**
Author Notification	**April 08, 2019**
Camera Ready	**April 20, 2019**

Conference Organization

General chair
Erik Elmroth, Umeå University and Elastisys, Sweden.
TPC co-chairs
Lydia Y. Chen, TU Delft, The Netherlands.
Bhuvan Urgoankar, Penn State University, USA.

Paper Submission

All submissions must represent original and unpublished work that is not currently under review. Each paper will be reviewed by at least three PC members. Papers are assessed based on originality, significance, interest, correctness, clarity, and relevance to the broader community. At least one author of each accepted paper is expected to attend the conference.

Each paper should be submitted in one of the following two categories, to which different acceptance criteria are to be applied:
- Full paper, limited to 10 pages including references (double column, IEEE format)
- Short paper, limited to 6 pages including references (double column, IEEE format)

Full papers are expected to report new scientific or engineering results, sharing experiences, measurements, use case studies, and appropriate quantitative evaluation if at all possible. Short papers can either be work in progress, or position papers that motivate the community to address new challenges. One paper among those that will be accepted for publication in the conference proceedings is going to be selected and awarded the Karsten Schwan Best Paper Award.

Papers should be submitted electronically in PDF format according to the instructions on the ICAC 2019 web: http://icac2019.cs.umu.se/. Submission web: https://icac19.hotcrp.com/

Scope and Topics

Computer systems of all types and sizes including cyber-physical systems, data centers/clouds, enterprise/office systems, and "Internet of Things," are becoming increasingly complex and burdensome for human administrators and operators to manage. Autonomic computing systems reduce this burden by managing their own behavior in accordance with high-level goals specified by humans or other computing systems. In autonomic systems, resources and applications are managed with no or minimal human intervention to maximize performance and minimize cost, while maintaining predictable and reliable behavior in the face of varying workloads, failures, and malicious threats. Achieving self-management requires and motivates research that spans a wide variety of scientific and engineering disciplines, including but not limited to artificial intelligence, bio-inspired computing, control theory, decision theory, distributed systems, emergent behavior analysis, machine learning, optimization, planning, software engineering, and user interface design.

The IEEE International Conference on Autonomic Computing (ICAC) has been the leading conference on autonomic computing since its inception in 2004. Continuing on its past successes, the 16th edition of ICAC will be held in Umea, Sweden during June, 2019, as part of the FAS* event federated with SASO 2019. The conference seeks novel research advances on science and engineering from both academia and industries, concerning all aspects of autonomic computing, including but not limited to the following research topics:

Foundations
- Fundamental theory of autonomic computing
- Algorithms, artificial intelligence, biological-inspired techniques, control theory, machine learning, operation research, probability and stochastic processes, queueing theory, rule-based systems, and socially-inspired techniques
- Formal models and analysis of self-management, emergent behavior, uncertainty, self-organization, self-awareness, and trustworthiness

Autonomic Cloud Computing
- Self-managing cloud services
- Cloud workload characterization and prediction
- Hypervisors, operating systems, middleware, and platforms for self-managing data centers and cloud infrastructures
- Monitoring, modeling and analysis of cloud resources and services
- Autonomic aspects of combining cloud computing with fog and edge computing

Cyber-Physical Systems (CPS) and Internet of Things (IoT)
- System architectures, services, middleware, and protocols for CPS and IoT
- Energy, real-time, and mobility management
- Design principles, methodologies, and tools for CPS and IoT
- Self-organization under severe resource constraints
- Applications and case studies of autonomic CPS and IoT
- Sensing and computing/storage/networking/power/cooling resource adaptation

Self-Organization and Organic Computing
- Self-organization principles and organic computing principles borrowed from systems theory, control theory, game theory,decision theory, social theories, biological theories, etc.
- Self-organization, emergent behavior, decentralized control, individual and social/organizational learning, scalability, robustness, goal- and norm-governed behavior, online self-integration for trustworthy self-organizing and organic systems
- Infrastructures and architectures for self-organizing systems and organic computing systems
- Applications and case studies for self-organization and organic computing

Emerging Computing Paradigms: Cognitive Computing, Self-Aware Computing
- Advanced learning for cognitive computing such as hyperparameter tuning, meta-cognitive learning, self-regulatory learning, consciousness and cognition in learning, collaborative / competitive learning, and online / sequential learning
- Architectures, control, algorithmic approaches, instrumentation, and infrastructure for cognitive computing and self-aware systems
- Cognitive computing and self-awareness in heterogeneous and decentralized systems
- Applications and case studies for social networks, big data systems, deep learning systems, games, and artificial assistants, cognitive robots, and systems with self-awareness and self-expression

Software Engineering for Autonomic Computing Systems: Architecture, Specifications, Assurances
- Design methodology, frameworks, principles, infrastructures, and tools for development and assurances for autonomic computing systems
- System architectures, services, components and platforms broadly applicable for autonomic computing system engineering
- Goal specification and policies, modeling of service-level agreements, behavior enforcement, IT governance, and business-driven IT management
- Applications and case studies for software engineering approaches for autonomic computing systems

Cross-cutting Themes
- Resource management
- Applications and case studies of end-to-end design and implementation of systems for resource and performance management
- Autonomics for extreme scales, e.g., peta/exa-computing

In addition to fundamental results, ICAC is also interested in applications and experiences with prototyped or deployed systems solving real-world problems in science, engineering, business, or society. Typical application areas for ICAC include but are not limited to autonomous robotics, cloud/fog/edge computing, cyber-physical systems, data centers, dependable computing, industrial internet / industry 4.0, internet of things, mobile computing, service-oriented systems, smart buildings, smart city, smart grid / energy management, smart factory, smart user interfaces, space applications, and traffic management.