TCS Special on Stabilization, Safety and Security

Call for Papers

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Special Issue on
Stabilization Safety and Security


Self-Stabilization is the property of a system, component, process or object to right itself no matter how severely its state variables, including memory, message buffers, and registers, are corrupted.
Self-stabilization is most interesting for distributed and concurrent systems, because local detection of a faulty condition is problematic.


Beyond the theory, self-stabilization is a guiding principle in many network protocols (in fact, a number of Internet and LAN protocols are self-stabilizing or very nearly so). Recent applied research has succeeded in demonstrated self-stabilizing, hardware, operating systems and file systems and in implementing protocols for routing, reprogramming, and synchronizing nodes in sensor networks. These examples show how the principles of self-stabilization can be used to implement lightweight solutions to the problems of fault tolerance in practical systems.

Recent interest of the field is in the design and development of fault-tolerant distributed systems with self-* properties, such as self-stabilizing, self-configuring, self-organizing, self-managing, self-repairing, self-healing, self-optimizing, self-adaptive, and self-protecting areas of algorithmic techniques, formal methodologies, model theoretic issues, and composition techniques. All these areas are essential to the understanding and maintenance of self-* properties in fault-tolerant distributed systems. Research in distributed systems is now at a crucial point in its evolution, marked by the importance of dynamic systems such as peer-to-peer networks, large-scale wireless sensor networks, mobile ad hoc networks, robotic networks, etc. Moreover, new applications such as grid and web services, banking and e-commerce, e-health and robotics, aerospace and avionics, automotive, industrial process control, etc. have joined the traditional applications of distributed systems.

Now, more than ever, the theory of self-stabilization has tremendous impact in these areas. Last two years, the scope of the symposium was expanded to cover all safety and security related aspects of self-* systems. The symposium solicits contributions on all these aspects from theoretical contributions, to reports of the actual experience of applying the principles of self-stabilization to static and dynamic systems. Topics of interest include, but are not limited to:
Stabilization

- self-stabilizing systems
- self-managed, self-assembling, autonomic and adaptive systems
- self-optimizing and self-protecting systems
- self-* abstractions for implementing fundamental services in static and dynamic distributed systems
- impossibility results and lower bounds for self-* systems
- application of stabilizing algorithms and techniques in dynamic distributed systems
- data and code stabilization
- algorithms for self-* error detection/correction
- models of fault-tolerant communication
- stochastic, physical, and biological models to analyze self-* properties

Safety

- safety critical systems
- trust models and specifications
- semantics of trust, distrust, mistrust, over-trust, cheat, risk and reputation
- trust-related security and privacy
- reliable and dependable systems
- fault-tolerant algorithms and systems, hardware redundancy, robustness, survivable systems, failure recovery
- program maintenance for safety preservation
- peer-to-peer networks, sensor networks, MANETs, and wireless mesh networks
- self-* properties and their relation with classical fault-tolerance
- safety of election systems

Security

- security of network protocols
- security of sensor and mobile networks protocols
- secure architectures, frameworks, policy, intrusion detection/awareness
- proactive security
- security protocols for self-* systems
- peer-to-peer networks, sensor networks, MANETs, and wireless mesh networks
- security of election systems

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