Software Architectures for Smart and Adaptive Systems

This special issue on Software Architectures for Smart and Adaptive Systems (SASAS) aims to outline the importance of the *architectural aspects* in the development of dynamic software solutions for organizations, and their role in ensuring and improving the overall quality of the software.

Smart and adaptive solutions are aware at run-time of their execution environment and of their internal structure and behavior. Further, they exploit this awareness to adapt reactively, proactively, predictively, and intelligently to the context and to provide smart and enhanced services that meet the users' needs and ensure the required and expected quality. In smart and adaptive systems, the decision process tends to move from design to run-time, where the context plays a key role in the system behavior. This shift from the design to run-time is mostly due to the uncertainties triggered by changes in the execution environment, the behavior of the users, or the changes in the requirements which cannot be anticipated during the development phase. Therefore, a smart and adaptive system should be able to address and manage these uncertainties based on the available knowledge about itself and its execution surroundings. Software is expected to make wise use of this knowledge at run-time. An important challenge is related to the provision of guaranties in for such systems potentially exposed to continuous uncertainties.

The complexity of smart and adaptive software is increasing every day, due also to the inclusion of various methods taken from areas different from pure software engineering, such as Artificial Intelligence, Industry 4.0 just to mention two common examples. Thus, software asks for innovative and enhanced engineering, maintenance, and evaluation approaches and practices to address the continuously changing requirements and expectations of the IT and business world, as well as the evolution of the available solutions. In this context, software architecture defines the basic blocks to prepare and ensure the quality attributes of a system.

This SASAS special issue calls for contributions that identify and describe the issues and challenges raised by the development and the evolution of software systems that are context-aware, dynamic, distributed, autonomous, smart, adaptive, mobility-enabled, and self-managed from an architectural perspective. The software architecture establishes the fundamentals and the rules for the interaction, integration, communication, observation, and control aspects that should be addressed during the software development and maintenance phases. Furthermore, the special issue welcomes contributions concerning available research and industrial case studies and solutions, lessons learnt, addressed as well as open challenges in designing and developing software architectures for context-aware smart systems.

We call for original previously unpublished research and industrial papers. Further, we encourage the submission of extended versions of papers presented at the Workshop on Context-aware, Autonomous, and Smart Architectures (CASA 2020 - https://casaecsa.github.io/casa2020/) co-located with the 14th European Conference on Software Architecture (ECSA 2020).

Topics of Interest

This special issue on SASAS calls for scientific contributions, as well as practical and industrial experience reports in any of the following areas, that include, but not limited to:
- software architectures: surveys, issues, challenges, comparisons, research and proof-of-concepts in smart and adaptive systems;
- design and architectural patterns for smart and adaptive systems;
- architectural models and techniques for smart and adaptive systems;
- uncertainties and guaranties in software architectures for smart and adaptive systems;

- architecture description languages for smart and adaptive systems;
- standards for software architectures for smart and adaptive systems;
- model-driven engineering architectural approaches for smart and adaptive systems;
- Artificial Intelligence in software architectures for smart and adaptive systems;
- quality attributes for smart and adaptive systems;
- current practices in research and industrial projects for smart and adaptive systems;
- local, edge, and cloud computing for smart and adaptive systems;
- documental databases, big data, massive data management for smart and adaptive systems;
- architectural approaches for tackling uncertainty and emergent behavior in smart and adaptive systems;
- software architectures for self-aware, self-managed, self-configuration, self-organization, self-protection, self-improving systems;
- privacy, safety, security in smart and adaptive systems;
- social and ethical issues in smart and adaptive systems;
- maintenance and evaluation of software architectures for smart and adaptive systems
- green and energy-efficient solutions for smart and adaptive systems;
- software architectures for autonomous and unmanned vehicles;
- domain driven (e.g., healthcare, public administration) software architectures for smart and adaptive systems.

Furthermore, all submissions should be within the scope of the journal, please consult the journal home page at: https://www.journals.elsevier.com/information-and-software-technology

Important Dates

1 March 2021:	Full paper submission
1 June 2021:	Author notification (tentative)
1 September 2021:	Papers revisions (tentative)
30 October 2021:	Author final notification (tentative)
15 December 2021:	Final manuscript (tentative)

Submission Guidelines

All submissions should follow the journal submission guidelines, including maximum length requirements and having a structured abstract. The guidelines for authors can be found at: https://www.elsevier.com/journals/information-and-software-technology/0950-5849/guide-for-authors

All manuscripts submission and review will be handled by Elsevier Editorial System: https://www.evise.com/profile/#/INFSOF/login. When submitting, please select the following article type: "**SI: Software Architecture for Smart and Adaptive Solutions**" – SI:SASAS.

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