SAML 2021 - First International Workshop on Software Architecture and Machine Learning

Karthik Vaidhyanathan[a], Henry Muccini[b], Ivica Crnkovic[c],
Michael Keeling[d] and Ipek Ozkaya[e]

[a,b]*University of L'Aquila, L'Aquila, Italy*
[c]*Chalmers University of Technology), Sweden*
[d]*LendingHome, San Francisco, California, United States*
[e]*Carnegie Mellon University Pittsburgh, United States*

Software systems are becoming more and more complex due to their ever-increasing pervasive nature, resulting in various architecting challenges to ensure better performance, reliability, security, etc. On the other hand, the field of Machine Learning (ML) has advanced rapidly with the availability of a larger amount of data, better computing infrastructure supplemented by the increasing number of domain experts. This revolution has span ned across the different software domains, and as the years progress, software systems, by leveraging ML, are moving from the notion of being another software to more intelligent software systems. However, the increasing adoption of AI, especially ML, has given rise to different challenges associated with development practices, deployments, ensuring data quality, etc., in addition to the challenges of a traditional software system. In recent times, both the research and practitioner community have started exploring these research areas at the intersection of Software Architec-

ture (SA) and ML. As a result, there have been emerging contributions from the scientific and practitioner community in these two research areas. However, these contributions are scattered across different communities of software engineering, self-adaptation, ML, etc. The objective of the First International Workshop on Software Architecture and Machine Learning (SAML) 2021 was to bring together practitioners and the research community in one common platform to explore: i) how to come up with better SA practices for architecting ML-based systems; ii) how to leverage ML techniques to better architect software systems; iii) state of research and practice in architecting ML-based systems and in using ML techniques for architecting modern software systems.

The SAML 2021 workshop was held in virtual mode on September 14, 2021, and was collocated with the European Conference on Software Architecture (ECSA). The workshop received a total of six high-quality submissions (two full papers, three short papers, and one position paper) with authors representing seven different countries. After a thorough single-blind peer-review process involving three members from the Program Committee per submission, five were accepted (one full paper, three short papers, and one position paper). The accepted papers covered dif-

✉ karthik.vaidhyanathan@univaq.it (K. Vaidhyanathan); henry.muccini@univaq.it (H. Muccini); ivica.crnkovic@chalmers.se (I. Crnkovic); michael.keeling@gmail.com (M. Keeling); ozkaya@sei.cmu.edu (I. Ozkaya)

CEUR Workshop Proceedings (CEUR-WS.org)

ferent areas of using ML techniques for extracting architecture descriptions, a reference architecture for ML-enabled systems, technical debt in ML-enabled systems, and self-adaptation for ML-enabled systems.

The workshop program included a keynote by Liming Zhu, Research Director, Data61, Austrailia on Distributed Trust Architecture - The New Reality of ML-based Systems. Further, the workshop program consisted of paper presentations, interactive discussions, and a panel consisting of members from academic and practitioner communities: i) Jan Bosch, Chalmers University of Technology Sweden; ii) Timothy J. Halloran, Software Engineer, Google, USA; iii) Grace Lewis, Principal Researcher and Lead of TAS, Carnegie Mellon University, USA; and iv) Anastas Stoyanovsky, Staff Software, Lending Home, USA. The attendees of SAML 2021 represented an international audience, and the discussions contributed to expanding further the research boundaries of SA for ML and ML for SA.

We would like to thank the program committee members for all the support and for providing high-quality reviews. We would also like to thank the ECSA 2021 Organizing Committee, particularly the workshop chairs Matthias Galster and Patrizia Scandurra, for their valuable help and support.

Workshop Chairs

- Karthik Vaidhyanathan - University of L'Aquila, Italy

- Henry Muccini - University Of L'Aquila, Italy

- Ivica Crnkovic - Chalmers University of Technology, Sweden

- Michael Keeling - LendingHome, United States

- Ipek Ozkaya- Carnegie Mellon University, United States

Program Committee

- Jan Bosch - Chalmers University of Technology, Sweden

- Tomas Bures - Charles University, Czech Republic

- Ilias Gerostathopoulos - Vrije University, Netherlands

- Ian Gorton - Northeastern University, United States

- Helena Holmström Olsson - Malmö University, Sweden

- Grace Lewis - Carnegie Mellon University, United States

- David Lo - Singapore Management University, Singapore

- Lucy Ellen Lwakatare - University of Helsinki, Finland

- Tommi Mikkonen - University of Helsinki, Finland

- Jørn Ølmheim - Equinor ASA, Norway

- Romina Spalazzese - Malmö University, Sweden