

---

## Preface

Science, technology, and commerce increasingly recognise the importance of machine learning approaches for data-intensive, evidence-based decision making. This is accompanied by increasing numbers of machine learning applications and volumes of data. Nevertheless, the capacities of processing systems or human supervisors or domain experts remain limited in real-world applications. Furthermore, many applications require fast reaction to new situations, which means that first predictive models need to be available even if little data is yet available. Therefore approaches are needed that optimise the whole learning process, including the interaction with human supervisors, processing systems, and data of various kind and at different timings: techniques for estimating the impact of additional resources (e.g. data) on the learning progress; techniques for the active selection of the information processed or queried; techniques for reusing knowledge across time, domains, or tasks, by identifying similarities and adaptation to changes between them; techniques for making use of different types of information, such as labeled or unlabeled data, constraints or domain knowledge. Such techniques are studied for example in the fields of adaptive, active, semi-supervised, and transfer learning. However, this is mostly done in separate lines of research, while combinations thereof in interactive and adaptive machine learning systems that are capable of operating under various constraints, and thereby address the immanent real-world challenges of volume, velocity and variability of data and data mining systems, are rarely reported. Therefore, this workshop and tutorial aims to bring together researchers and practitioners from these different areas, and to stimulate research in interactive and adaptive machine learning systems as a whole. It continues a successful series of events at ECML PKDD 2017 in Skopje (Workshop & Tutorial), IJCNN 2018 in Rio (Tutorial), and ECML PKDD 2018 in Dublin (Workshop).

The workshop aims at discussing techniques and approaches for optimising the whole learning process, including the interaction with human supervisors, processing systems, and includes adaptive, active, semi-supervised, and transfer learning techniques, and combinations thereof in interactive and adaptive machine learning systems.

All in all, we accepted six regular papers (9 papers submitted) and three short papers (4 submitted) to be published in these workshop proceedings. The authors discuss approaches, identify challenges and gaps between active learning research and meaningful applications, as well as define new application-relevant research directions. We thank the authors for their submissions and the program committee for their hard work.

September 2019

Adrian Calma, Andreas Holzinger  
Daniel Kottke, Georg Kreml, Vincent Lemaire

---

## **Organizing Committee**

Adrian Calma, University of Kassel  
Andreas Holzinger, Graz University of Technology  
Daniel Kottke, University of Kassel  
Georg Kreml, Utrecht University  
Vincent Lemaire, Orange Labs France

## **Program Committee**

Albert Bifet, LTCI, Telecom ParisTech  
Giacomo Boracchi, Politecnico di Milano  
Martin Holeňa, Institute of Computer Science, Prague  
Edwin Lughofer, University of Linz  
Christin Seifert, University of Twente  
Jerzy Stefanowski, Poznan University of Poland  
Indrė Žliobaitė, University of Helsinki