A Tutorial Workshop on ML for Systems and Systems for ML

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Abstract: This tutorial workshop on ML for Systems and Systems for ML is held on Tuesday, March 7th in conjunction with BTW 2023. In this workshop, we invite and bring together researchers working actively in the research areas at the intersection of machine learning and data management systems. There are invited/nominated talks on two topics of concern: (1) how machine learning can help or aid in data management system tasks (ML for Systems side) and (2) how scalable and efficient system design can improve machine learning pipelines (Systems for ML side). The talks will present accepted peer-reviewed work in a tutorial fashion to give hints on the current establishment in the two topics of concern and open research challenges thereby. The workshop showcases 13 high-quality talks with speakers from North America and all over Europe.

1 Introduction

The current advances in machine learning (ML) have led to a wide adoption of ML in different application areas across academia as well as industry. On the one hand, these novel advancements have helped existing data management systems to improve, by sometimes even completely replacing specific components with so-called *learned system components* (ML for Systems area). On the other hand, the advancements in well-thought and engineered systems aid in improvements of current ML techniques (Systems for ML area). For instance, in databases, there has been a surge in replacing the manually designed parts of databases with learned counterparts, such as learned query optimizers, learned indexes, learned cardinality and cost estimators, and even query schedulers. There have been also prominent examples where data access methods, such as indexing, and data flow optimizations have improved ML techniques. Such approaches have led to autonomy in developing data management systems and hence avoiding manual tuning by an administrator that current data management systems succumb in.

It is often challenging for researchers to keep up with the pace of these two emerging research areas, which is what we aim to make easier by means of this workshop tutorial. Therefore, in this workshop, we invite 13 speakers working in these areas who will present their already accepted peer-reviewed work in a tutorial fashion and give hints on their current work and open research challenges they are currently facing.

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2 Organization Committee

Workshop Co-chairs. This workshop is co-organized by the following workshop chairs drawing from their previous experience and papers in this area.

- Manisha Luthra (TU Darmstadt)
- Andreas Kipf (Amazon Web Services)
- Matthias Boehm (TU Berlin)

Local Organization Chair. The local organization of the workshop as well as the website is handled by Lucas Woltmann from TU Dresden.

3 Workshop Format

Hybrid format. While we encourage in-person speakers and participants, we allow for hybrid attendance to account for the current travel restrictions. Therefore, the workshop is held in a hybrid format (in-person and remotely) with the following full-day schedule.

- The first half covers the Systems for ML area
- The second half covers the ML for Systems area

Invited Speakers. We have invited a balanced mix of speakers presenting their published prior work and open challenges in these two areas. With this workshop, we want to foster discussions and collaborations among the participants, and at the same time, give the speakers a platform to boost their work and gain visibility.

- Ziawasch Abedjan (Leibniz University Hannover)
- Stefan Hagedorn (TU Ilmenau)
- Benjamin Hilprecht (TU Darmstadt)
- Madelon Hulsebos (University of Amsterdam)
- Ryan Marcus (University of Pennsylvania)
- Arnab Phani (TU Berlin)
- Theodore Rekatsinas (ETH Zurich)
- Alexander Renz-Wieland (TU Berlin)
- Sebastian Schelter (University of Amsterdam)
- Stefanie Scherzinger (University of Passau)
- Maximilian E. Schüle (University of Bamberg)
- Immanuel Trummer (Cornell University)
- Giorgio Vinciguerra (University of Pisa)