CALL FOR PAPERS
ACM Journal Transactions on Computing Education

Special Issue on Machine Learning Education

Guest Editors: R. Benjamin Shapiro & Rebecca Fiebrink

Abstract submission deadline April 6, 2018
Full paper submission deadline June 15, 2018

We are pleased to announce a Special Issue on **Machine Learning Education** that will be published by the ACM Transactions on Computing Education (TOCE) in 2019. ACM TOCE covers diverse aspects of computing education by publishing papers with a scholarly approach to research on teaching and learning, a broad appeal to educational practitioners, and a clear connection to student learning.

This special issue focuses on machine learning education. Machine learning is currently transforming many areas of computer science: from natural language processing and search to computer music, many systems that were once made with symbolic systems are now hybrids of symbolic and statistical machinery. This shift presents new challenges and opportunities for learning about computer science, and for studying learning about computing. To date, however, little research has examined the teaching and learning of machine learning.

Aim and Scope

We invite research papers on any aspect of machine learning education. These include papers informed by practice, such as empirical examinations of current teaching practices--both within machine learning courses and throughout broader curricula--or innovative approaches to supporting and assessing student learning. Practice-led papers should include a foundation in relevant theories of human learning, draw on prior research about learning, and include a methodologically appropriate description and evaluation of teaching interventions. We also invite theoretical papers that describe new possibilities for supporting and studying machine learning education.

The key goals of this special issue are to provide a foundation for understanding current and best practices in machine learning education, and to identify future directions for research and education.

Potential topics include, but are not limited to, the following questions of machine learning (ML) education:

- Where should ML be introduced in the CS curriculum? What should all CS students learn about ML? What should non-CS students learn about ML? What are the prerequisite knowledge and skills for learning about ML?
- How do students reason about how machine learning systems work, and how they work in interaction with traditional (symbolic) computing systems? What notional machines are helpful or problematic?
- How does probabilistic programming serve as a bridge for students between imperative and statistical ways of constructing systems?
- What should students learn about the *practice* of ML? What should the relationship be between ML theory and ML practice within particular ML education contexts?
- How does ML education happen beyond traditional machine learning university courses? For instance, how are computing professionals learning about ML on the job?
- What does computational thinking mean in a machine learning context? How do we have to modify existing frameworks to account for ML?
- What knowledge about statistics and ML do teachers need to have to productively teach ML? How do they leverage this knowledge in teaching practice? What are the implications of these for CS teacher education?
- What should ML education researchers learn from math & statistics education research, and what new opportunities might exist for enhancing math & statistics education?
- What kinds of tools can successfully scaffold ML learning?
- How should we assess learning of ML?
- What do industry practitioners think university coursework on ML should cover?
- How should ML education address ethics?
- How does ML create new opportunities for CS to integrate with other subject areas, from the sciences to the humanities?
- What theories and methods for studying learning might be especially relevant to the domain of ML education?
- What research on learning about ML, AI, or other closely-related topics has already been conducted, and how should it inform future research?

This special issue on machine learning education follows from a recent workshop on Research on Learning About Machine Learning at the 2017 ACM International Computing Education Research (ICER) conference.

Important Dates:
Extended abstracts[1] (up to 1000 words): April 6, 2018
Decisions on abstracts: April 20, 2018
Full papers due[1]: June 15, 2018
Notification of Acceptance: October 19, 2018
Revised manuscripts due: December 14, 2018
Special issue published: March 15, 2019

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[1] Please submit using the "ML Education" paper category in Manuscript Central

Submit abstracts and, later, papers via Manuscript Central, using the "ML Education" paper category. TOCE uses the _**Small**_ Standard Journal Format as found at https://www.acm.org/publications/authors/submissions. Use this style for extended abstracts as well as the full paper if your abstract is accepted. For more information about TOCE and the author guidelines, see http://toce.acm.org/authors.cfm.

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