

Machine learning for science and society

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Abstract The special issue on “Machine Learning for Science and Society” showcases machine learning work with influence on our current and future society. These papers address several key problems such as how we perform repairs on critical infrastructure, how we predict severe weather and aviation turbulence, how we conduct tax audits, whether we can detect privacy breaches in access to healthcare data, and how we link individuals across census data sets for new insights into population changes. In this introduction, we discuss the need for such a special issue within the context of our field and its relationship to the broader world. In the era of “big data,” there is a need for machine learning to address important large-scale applied problems, yet it is difficult to find top venues in machine learning where such work is encouraged. We discuss the ramifications of this contradictory situation and encourage further discussion on the best strategy that we as a field may adopt. We also summarize key lessons learned from individual papers in the special issue so that the community as a whole can benefit.

1 Why a special issue on impact to science and society?

In this special issue, we showcase machine learning work that addresses problems of importance to science and society. Machine learning (ML) and data mining have been used, and will continue to be used, in many important domains that affect people’s lives every day; however, it is not common in many mainstream machine learning venues to publish work whose primary goal is to have impact on a new real-world problem. The collection of papers

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