Algorithmic Fairness: Measures, Methods and Representations*

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ABSTRACT

What happens when we replace — or augment — human decision-making with algorithms? This is a simple question, but the answers now define a new field of study — a field that I call algorithmic fairness, and that spans issues of fairness, discrimination, accountability, transparency, interpretability and responsibility, and so much more. While some of the early work in the area came out of data mining and machine learning, the field is now truly transdisciplinary, with contributions from all across computer science, as well as from all disciplines that touch on aspects of society - whether it be economics, philosophy, sociology, political science, or communication.

In this tutorial, I'll try to do three things: I'll survey the main questions and some of the key insights we've developed over the years. I'll explain the web of connections between the technical and the social disciplines that make up this area,

and I'll point to exciting directions that remain to be explored in both technical and social dimensions.

Along the way I hope to illustrate what I think are some interesting “collisions” between computer science and the social sciences, and call for a reimagining of core ideas in our field, including the very idea of how we think about data representation.

KEYWORDS

algorithmic fairness, interdisciplinary, decision-making

ACM Reference Format:

Suresh Venkatasubramanian. 2019. Algorithmic Fairness: Measures, Methods and Representations. In *38th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS'19), June 30–July 5, 2019, Amsterdam, Netherlands*. ACM, New York, NY, USA, 1 page. <https://doi.org/10.1145/3294052.3322192>

*This work is partially supported by the National Science Foundation under grant IIS-1633724

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PODS'19, June 30–July 5, 2019, Amsterdam, Netherlands

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ACM ISBN 978-1-4503-6227-6/19/06.

<https://doi.org/10.1145/3294052.3322192>