

Examining the Global Reach of Algorithms



A foundational concept in computer science, algorithms—loosely defined as sets of rules to direct the behavior of machines or humans—have shaped infrastructures, practices, and daily lives. In today’s world, algorithms are having a profound impact on all dimensions of society, from policing and governance to business, urban planning, education, and countless other domains. The need to understand the development and deployment of algorithms has become ever more pressing, both in academia and public discourse.

To support this understanding, Social Science Matrix is sponsoring a year-long Project Team—a group of social scientists, computer scientists, and humanities scholars—who are studying algorithms beyond the traditional concerns and approaches of computer science, while still tracking the computational practices that deploy them today.

The team is led by a group of scholars from the Center for Science, Technology, Medicine and Society (CSTMS), including Morgan G. Ames, a postdoctoral scholar who studies technological utopianism in computing cultures; Gretchen Gano, who seeks to understand sociotechnical innovation

systems as an input to decision-making and public policy; and Massimo Mazzotti, who researches social processes around mathematics, logic, and deductive reasoning. CSTMS is a Matrix-affiliated center that, among its programs, has launched an initiative called “The Cloud and Crowd” dedicated to exploring the implications of crowdsourcing, cloud computing, social media, and the rise of Big Data.

The interdisciplinary Matrix Team is exploring the multifaceted roles that algorithms play in politics, media, science, organizations, and identity in everyday life. This team’s work carries forward the work of a 2014-2015 Matrix research team, “Algorithms as Computation and Culture,” which was spearheaded by Professor and CSTMS affiliate Jenna Burrell.

Among the questions the team is addressing: what are the multiple definitions and histories of algorithms? What does it mean to study algorithms as myth, narrative, ideology, discourse, or power, and in what ways can these approaches contribute back to concepts and questions within computer science? What kinds of applications and activities are now possible given developments in computational infrastructure and theories of computation, such as deep neural networks, distributed computing, or ‘microwork’? How can we better understand the implications of algorithmically-managed selves in everyday and civic life?

As part of their work with Matrix, the research team organized a successful academic conference on algorithms in culture, and they are planning a second conference on “The



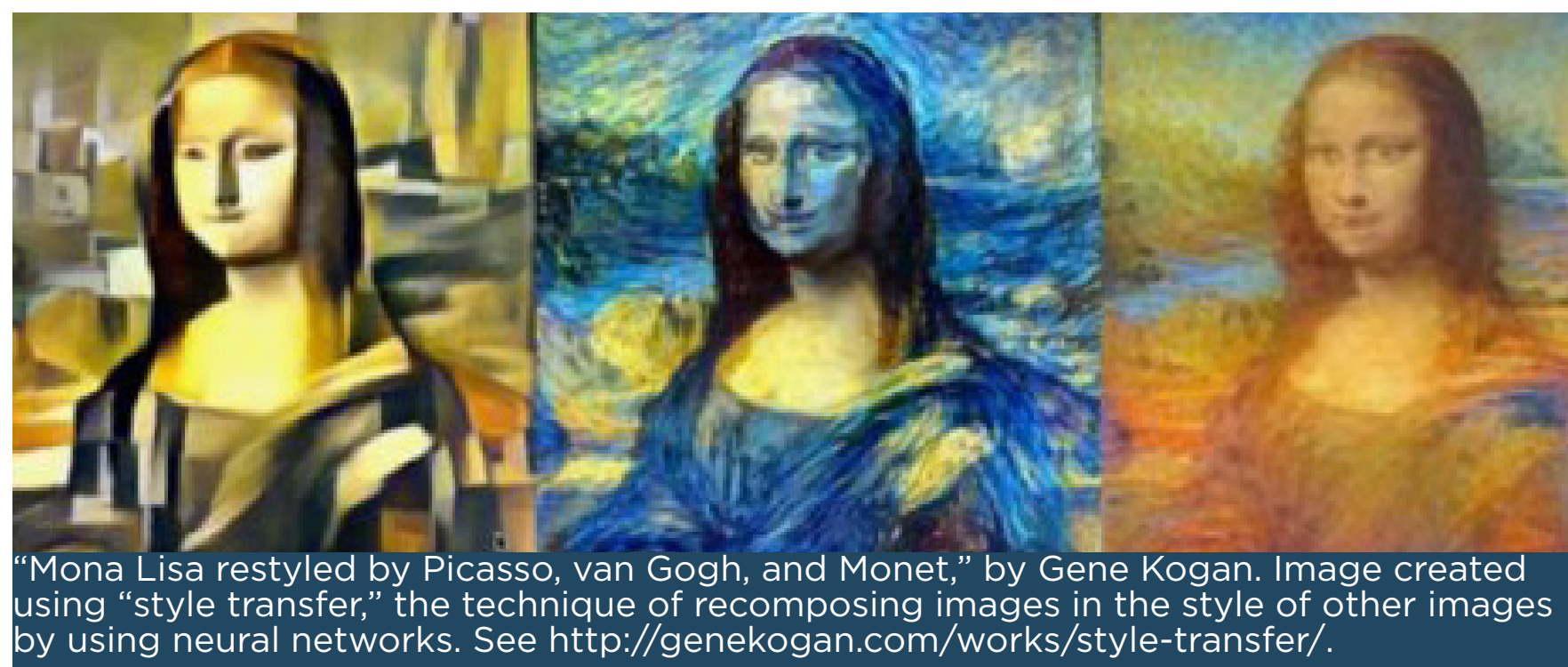
On December 1-2, 2016, CSTMS and BIDS co-hosted the “Algorithms in Culture” conference, which drew standing-room-only crowds of over 100 attendees from across the UC Berkeley community, as well as 24 luminaries and rising stars in algorithm studies from around the world. The team also organized the “Longue Duree History of Algorithmic Thinking in Mathematics” symposium, bringing together leading scholars in the history of mathematics. See <https://sites.google.com/site/algorithmsculture>.

Longue Duree History of Algorithmic Thinking in Mathematics,” focused on the intersection between mathematics and the critical study of algorithmic life historically. They also are preparing two special journal issues on the topic of algorithms in culture in *Big Data & Society* and *Representations*, as well as a book dedicated to the multiple histories of algorithms around the world.

“These two initiatives will provide the academic community at Berkeley and around the world an anchor and point of reference for future studies of algorithms,” the team’s organizers wrote in their proposal. “This project will position Berkeley as a center for this scholarship going forward.”

RESEARCH GOALS

- Provide the academic community at Berkeley and around the world with an anchor and point of reference for future studies of algorithms.
- Position UC Berkeley as a global center for scholarship around algorithms in society.
- Organize conferences and workshops and publish papers to advance dialogue around algorithms in history and in the modern world.



“Mona Lisa restyled by Picasso, van Gogh, and Monet,” by Gene Kogan. Image created using “style transfer,” the technique of recomposing images in the style of other images by using neural networks. See <http://genekogan.com/works/style-transfer/>.

In addition to organizing two conferences, the Matrix Project Team prepared a series of papers for special issues of *Big Data & Society*, *Representations*, and *IEEE Annals of the History of Computing*. Titles of papers include: “Algorithms in Practice: Comparing Web Journalism and Criminal Justice,” “Algorithms as Culture: Some Tactics for the Ethnography of Algorithmic Systems,” and “State of Urgency: The Implications of Police Software Algorithms in France’s State of Emergency.”



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