



America at 250: A Beacon for the AI Age Conference

BOSTON GLOBAL FORUM · AI WORLD SOCIETY · LOEB HOUSE, HARVARD UNIVERSITY · MAY 1, 2026

SPECIAL PROFILE

Cynthia Dwork

Architect of Differential Privacy and Algorithmic Fairness

Gordon McKay Professor of Computer Science, Harvard University

National Medal of Science · 2024

Japan Prize · 2026 · IEEE Hamming Medal · Knuth Prize · Gödel Prize

Member, U.S. National Academy of Sciences · National Academy of Engineering

Honored as one of the America 250 · AI Pioneers



I **The Mathematics of Privacy**

INVENTING DIFFERENTIAL PRIVACY AND MODERN CRYPTOGRAPHY

Cynthia Dwork is among the most consequential American computer scientists of the modern era — a researcher whose foundational work has placed privacy-preserving data analysis on a mathematically rigorous footing, and whose ideas now quietly govern how billions of people interact with technology each day. As the Gordon McKay Professor of Computer Science at Harvard’s John A. Paulson School of Engineering and Applied Sciences, she stands among a generation of researchers who insisted that the moral foundations of computing must be made mathematical.

In the mid-2000s, working with collaborators Frank McSherry, Kobbi Nissim, and Adam Smith, Dwork co-developed **Differential Privacy** — a strong, mathematically rigorous privacy guarantee that permits sophisticated data analysis while protecting the individuals whose data is being studied. Today, differential privacy is **embedded in every Apple device**, deployed across the global technology industry, and forms the backbone of the Disclosure Avoidance System for the **2020 U.S. Decennial Census** — the first time the U.S. government applied a mathematically provable privacy guarantee to one of the nation’s largest civic exercises.

Her contributions extend far beyond differential privacy. Earlier work on non-malleable cryptography, with Danny Dolev and Moni Naor, modernized cryptography for the open internet; her lattice-based public-key cryptosystem, with Milos Ajtai, provided a proof-of-concept for the post-quantum era as well as the first system for which random instances are provably as hard to crack as the hardest; her 1993 introduction of “proof of work” would later become the foundation of modern cryptocurrencies; and her work on consensus and partial synchrony, recognized with the Edsger W. Dijkstra Prize, established pillars on which every fault-tolerant distributed system has since been built and provided the model and several key algorithmic ideas underpinning many modern digital currencies and blockchains.

*“What is the meaning of the probability of a non-repeatable event?
Without a definition, how can we even specify the goal of an ideal
prediction algorithm?”*

— CYNTHIA DWORK, ON THE DEFINING PROBLEM OF ARTIFICIAL
INTELLIGENCE

II *Fairness in the Age of Algorithms*

FROM PRIVACY TO THE MATHEMATICAL CONSCIENCE OF AI

In **2012**, Dwork launched the theoretical investigation of **algorithmic fairness** — the mathematical study of how prediction systems can be designed to treat people equitably. What began as a foundational inquiry has since become a central field of computer science, with implications across hiring, lending, healthcare, criminal justice, and the design of every consequential AI system. Her current work, including the multidisciplinary Hire Aspirations Institute on fairness in hiring platforms, brings these mathematical foundations to the institutions that will shape the lives of millions.

Dwork has also given the first general approach to ensuring statistical validity in adaptive data analysis — a connection to differential privacy that addresses how rigorous conclusions can be drawn from data when the analyst’s questions are themselves shaped by what the data reveals. In an age in which artificial intelligence is increasingly deployed to assign scores, rank candidates, and make life-altering predictions, her work poses the defining question of the field: what does it mean for a prediction to be fair, when the event being predicted may never repeat?

For this body of work, Dwork has received nearly every major honor in computing — including the Gödel Prize, the Knuth Prize, the IEEE Hamming Medal, the ACM Paris Kanellakis Award, the Edsger W. Dijkstra Prize, the 2026 Japan Prize, and, in January 2025, the U.S. National Medal of Science, one of the nation’s highest scientific honors. She is a member of the National Academy of Sciences and the National Academy of Engineering, and a Fellow of the American Academy of Arts and Sciences, the American Philosophical Society, and the ACM.

“The deepest privacy and fairness questions are not, finally, technical questions. They are questions about what we owe to one another — and mathematics gives us the discipline to ask them honestly.”

III **America at 250: AI Pioneers**

HONORING THE FOUNDATIONAL WORK THAT WILL DEFINE THE AI AGE

At the **America at 250: A Beacon for the AI Age Conference** at Loeb House, Harvard University, on **May 1, 2026**, Governor **Michael Dukakis** and **Nguyen Anh Tuan** honor Cynthia Dwork as one of the **America 250 · AI Pioneers** — the fifty leaders whose work is shaping America in the Age of Artificial Intelligence. The recognition celebrates a body of work that has redefined how the world thinks about privacy, fairness, and the mathematical foundations of trustworthy computing.

The Conference’s honor recognizes the conviction that has guided Dwork’s career across four decades: that the moral commitments of a society — to the privacy of its citizens, to the fairness of its institutions, to the integrity of its public statistics — must be made mathematically precise if they are to survive the digital age. In an era when artificial intelligence is reshaping how human beings live, work, and are seen by powerful systems, her insistence that values be encoded into the mathematics, and not left to good intentions, has become one of the defining contributions of American computer science to the AI Age.

“The systems we build today will outlast us. The values they encode will shape the lives of people we will never meet. That is the responsibility of mathematics in the AI Age.”



From the foundational mathematics of differential privacy to the theoretical investigation of algorithmic fairness, from the protection of every Apple device to the integrity of the U.S. Decennial Census, Cynthia Dwork has spent her career building the mathematical conscience of the information age. America at 250 honors that lifetime of work — and the future it is helping to make trustworthy.

CONCLUSION

*From the invention of differential privacy to the theoretical foundations of algorithmic fairness, from the cryptography that secures the open internet to the integrity of the U.S. Census, **Cynthia Dwork** has built the mathematical conscience of the **information age** — work that will guide the design of trustworthy artificial intelligence for generations, and remind us that the values we encode in our systems are the values we leave for those who follow.*



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