

Pratik Shah

Principal Research Scientist, Health 0.0, MIT

Accessible AI in healthcare



Biography

Pratik Shah is an internationally recognized expert on developing and using actionable and accessible AI, machine learning technologies and investigating their impact on the future of biology, medicine, and healthcare.

Pratik leads the Health 0.0 research program at the Massachusetts Institute of Technology. His group's research focuses on understanding current and future AI and machine learning capabilities for transforming healthcare via novel digital medicines, pragmatic regulatory strategies, and real-world validation and deployment of emerging technologies.

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Topics

*Artificial Intelligence
Innovation
Technology*

Pratik Shah has significant experience in the invention and deployment of unorthodox medical technology solutions that are more effective, less costly, ethical and explainable. He is an advisor to government and philanthropic funding agencies for implications and applications of emerging technologies in healthcare and medicine.

Pratik has been invited to speak at multiple distinguished academic venues such as Gordon Research Seminars, American Association for the Advancement of Sciences, Cold Spring Harbor Laboratories, Gordon Research Conferences, The National Academies of Sciences, Engineering and Medicine, MIT, and given keynotes at industry and technology events and is a TED speaker.

Medical imaging technologies using unorthodox artificial intelligence for early disease diagnoses:

Pratik's work has created new paradigms for obtaining medical diagnostic information of organs and tissues from photographs captured by mobile phones and cameras. For example, his group has devised a novel "Computational staining" system to digitally stain photographs of unstained tissue biopsies with virtual dyes to diagnose cancer. And has described an automated

"Computational destaining" algorithm that can remove dyes and stains from photographs of previously stained tissues to reuse patient samples. His current research at MIT develops several such neural networks and AI systems to help physicians and hospitals in providing timely information to patients while saving time, money and precious samples.

Novel ethical and explainable artificial intelligence-based digital medicines and treatments: Pratik's research at MIT has described the validation of novel AI systems for designing faster, safer, and more efficacious digital medicines and clinical trials. Powered by "self-learning" ethical and explainable learning AI systems that can learn from diverse and inclusive clinical datasets to reduce chemotherapy toxicity in cancer patients, predict and enrich novel and unorthodox digital endpoints to accelerate clinical research and development, and pioneer a regulatory path for artificial intelligence in healthcare. His work has a significant impact on the ethical decisions facing patients and their families, and regulatory decisions for the United States Food and Drug Administration (FDA) and European Medical Agencies (EMA).

• **Accomplishments:**

- ☐ American Society for Microbiology's Raymond W. Sarber National Award for his contributions to public health.
- ☐ Harvard Medical School and Massachusetts General Hospitals ECOR Fund for Medical Discovery postdoctoral fellowship.
- ☐ Discovery of a vaccine component to prevent pneumococcal (*Streptococcus pneumoniae*) diseases; identification of new pathways, technologies, and metabolites as antimicrobials to target gastrointestinal infections; and a non-profit organization to deploy a low-cost water quality test for the developing world.
- ☐ Pratik has BS, MS, and Ph.D. degrees in biological sciences and completed fellowship training at Massachusetts General Hospital, The Broad Institute of MIT and Harvard, and Harvard Medical School.
- ☐ Served as both peer and expert reviewer for leading scientific publications

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