Matt Beane

Technology Management Department
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ACADEMIC POSITIONS

University of California, Santa Barbara, Assistant Professor, Technology Management Program

Stanford University, Digital Fellow, Stanford Digital Economy Lab

Massachusetts Institute of Technology, Digital Fellow, Institute for the Digital Economy

EDUCATION

MIT Sloan School of Management **Cambridge, MA**
Ph.D., Management July, 2017
Information Technology major, Organization Studies minor

MIT Sloan School of Management **Cambridge, MA**
Master of Science, Management Research 2014

Bowdoin College **Brunswick, ME**
Bachelor of Arts in Philosophy 1997

RESEARCH FOCUS

I study how workers and organizations adapt to intelligent machines. I focus on skill development.

Broad Interests

Learning; Technology and Organizing; Human-Robot Interaction; Sociology of Work; Deviance; Practice Theory; Organizational Ethnography

Dissertation

Operating in the Shadows: The Productive Deviance Needed to Make Robotic Surgical Work.
Committee: Wanda Orlikowski (chair), Kate Kellogg, John Van Maanen

PUBLICATIONS

Beane, M. 2024. The Skill Code: How to Save Human Ability in an Age of Intelligent Machines. Harper Business.

Beane, M., & Anthony, C. 2024. Inverted Apprenticeship: How Senior Occupational Members Develop Practical Expertise and Preserve Their Position When New Technologies Arrive. Organization Science, 35(2), 405–431. https://doi.org/10.1287/orsc.2023.1688

Beane, M. 2023 Resourcing a Technological Portfolio: How Fairtown Hospital Preserved Results While Degrading its Older Surgical Robot. Administrative Science Quarterly, 68(3), 691–733. https://doi.org/10.1177/00018392231174450

Beane, M. & Leonardi, P. 2022 Pace Layering as a Metaphor for Organizing in the Age of Intelligent Technologies: Considering the Future of Work by Theorizing the Future of Organizing. *Journal of Management Studies. https://doi.org/10.1111/joms.12867*

Beane, M. 2022 Today's Robotic Surgery Turns Surgical Trainees into Spectators: Medical Training in the Robotics Age Leaves Tomorrow's Surgeons Short on Skills. *IEEE Spectrum* 59 (8), 32-37.

Chen, Z., Chen, W., Smiley, C., Shah, S., Borova, I., Langdon, D., Moussa, R., **Beane, M.**, Huang, T., Routledge, B. and Yang Wang, W. FinQA: A Dataset of Numerical Reasoning over Financial Data. *Proceedings of EMNLP-2021.*

Beane, M. & Brynjolfsson, E. 2020. Working With Robots in a Post-Pandemic World. *https://sloanreview.mit.edu/article/working-with-robots-in-a-post-pandemic-world/*

Beane, M. 2020. In Storage, Yet on Display: An Empirical Investigation of Robots' Value as Social Signals. *Proceedings of the 2020 ACM/IEEE International Conference on Human-Robot Interaction, HRI '20*: 83–91.

Beane, M. 2019. Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail. *Administrative Science Quarterly*, *64*(1), 87–123.

Beane, M. 2019. Learning to Work with Intelligent Machines. *Harvard Business Review*, 97(5), 140-149.

Johnson, M., **Beane, M.**, Mindell, D., & Ryan, J. 2019. Knowledge Management for Rapidly Extensible Collaborative Robots. *International Conference on Human-Computer Interaction*, (pp. 503–523).

Jung, M. F., **Beane, M.,** Forlizzi, J., Murphy, R., & Vertesi, J. (2017). Robots in Group Context: Rethinking Design, Development and Deployment. *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, 1283–1288.

Beane, M. and W. Orlikowski. 2015. What Difference Does a Robot Make? The Material Enactment of Distributed Coordination. *Organization Science* 26 (6), 1553-1573

Bettinelli, M., Y. Lei, **M. Beane**, C. Mackey, T. N. Liesching. 2015. Does Robotic Telerounding Enhance Nurse–Physician Collaboration Satisfaction About Care Decisions? *Telemedicine and e-Health*

Shen, S., Admoni, H., Harriott, C., Kim, Y., Marge, M., Vázquez, M., **Beane, M**., … Vozar, S. (2013). HRI Pioneers Workshop 2013. *2013 8th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 439–440.

LATEST WORK

Beane, M. "Engineering Skill: The Co-Development of AI-Enabled Robots and Career-enhancing Nonprofessional Skill at JointBot" [Preparing for Submission]

Beane, M. "Solve and Be Seen: Entry-Level Worker Skill Development During the Implementation of AI-enabled Robots in Warehousing" [Under Review]

Beane, M., Brynjolfsson, E., Li, Fei-Fei, Li, F. J., Mitchell, T., Rus, D. "What can robots do, and what does it mean for occupations and the economy?" (Lee, F., Rock, D., Beane, M. and Brynjolfsson, E.) (Instrument validation)

REFEREED CONFERENCES

2023 Surch: Enabling Structural Search and Comparison for Surgical Videos. Kim, J., Choi, D., Lee, N., **Beane, M.**, & Kim, J. Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems, 1–17. https://doi.org/10.1145/3544548.3580772

2019 Shadow Learning: Building Robotic Surgical Skill when Approved Means Fail. **Beane, M.** Symposium, OCIS, OMT division, Academy of Management, *Producing technological futures: Reflecting on workplace automation, inequality, and ethics*

2018 Making a Grey Hole: What it Took to Reduce the Risk of the Deviant Practices Required to Get Results from a Degraded Surgical Robot. Org Science Winter Conference. **Beane, M.**

2015 The Material Enactment of Coordination in Robotic and Traditional Surgery. **Beane, M.** Showcase symposium, OCIS, OMT and HCM divisions, Academy of Management, *The Role of Information Technology and Work Practices in Relational Coordination*

2014 What Difference Does a Robot Make? Managing Ambiguity in Distributed Knowledge Work. **Beane, M.** and W. Orlikowski.
One of three Best Paper nominees, OCIS division, Academy of Management

PATENTS

2019 Mindell, D. A., G. L. Charvat, M. Hirsch, J. C. Kinsey, and **M. I. Beane**. "High precision time of flight measurement system for industrial automation." US Patent No. 10422870

INVITED TALKS/SERVICE

2024 Engineering Skill: The Co-Development of AI-Enabled Robots and Career-enhancing Nonprofessional Skill at JointBot, Stanford Digital Economy Lab

2024 Institute for Corporate Productivity, Annual Conference Keynote

2023 Learning to Work with Intelligent Machines, Thinkers50 Radar, Boston

2023 In Storage, Yet On Display: An Empirical Investigation of Robots as Social Signals, Guest lecture in Reimagining Technofuturism, Michigan Technological University

2023 Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail, MIT Innovation Lab Semi-Annual Meeting

2023 Solve and Be Seen: How Workers in Deskilled Jobs Develop Specialized Skill, Economics of Robots Conference, NYU Stern Center for the Future of Management, Washington, D.C

2023 Roundtable on Labor Implications of AI, Aspen Institute

2023 AI-enabled Automation in Warehousing, Labor and Employment Relations Association annual conference

2022 Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail, UC Santa Barbara Mind and Machine Intelligence Summit

2022 Learning to Work with Intelligent Machines, MIT Sloan - Global Business of AI and Robotics guest lecture

2022 AI-enabled Automation in Warehousing, US Department of Labor, Warehouse Briefing Session

2022 Resourcing a Technological Portfolio: How Fairtown Hospital Preserved Focal Results While Degrading its Older Surgical Robot, Perspectives on Achieving Research Convergence for Robotics-Enabled Future of Work, International Conference on Robotics and Automation

2021 Adapting to AI-enabled Automation: Focus on the Frontline Worker, Stanford University

2018 "Learning to Work with AI", *TED Talk*, Ted Headquarters, NY, NY

2018 "Making a Grey Hole: What it Took to Reduce the Risk of the Deviant Practices Required to Get Results from a Degraded Surgical Robot", *Organization Science Winter Conference*

2017 Panelist, CHI, annual meeting. "Robots in Group Context: Rethinking Design, Development and Deployment"

2017 Co-organizer, co-facilitator: *Boston Field Research Conference* (since 2012)

2016 We, Robot (law and AI conference): Discussant, Privacy and Healthcare Robots Panel

2016 New England Section of the American Urological Association annual meeting. "The Unintended Consequences of Robotic Surgical Practice for Resident Surgical Capacity".

2015 Human-Computer Interaction Institute Seminar Series, Carnegie Mellon University. Talk title: "When New Technology is Old: Organizing Surgery in the Face of Legacy Robotic Surgical Systems"

2012 Panel Chair, Human-Robot Interaction Pioneers Workshop, HRI (leading annual conference for human-robot interaction); Ad Hoc Reviewer, HRI (to present)

2011 Invitee, Human-Robot Interaction Pioneers Workshop, HRI

TEACHING FOCUS

Learning to Work with Intelligent Machines, Technology and Organizing, Technology and Work, Technological Change, Deviance, The Business of Robotics, Teaming and Collaboration, Leadership, Organization Development, Research Methods

SAMPLE PRACTITIONER PUBLICATIONS

Beane, M. In Automation, the 'Last Motion' Will Come Before the Last Mile. 2019. Wired.com

Beane, M. Robots Might Not Take Your Job—But They Will Probably Make It Boring. Wired.com

Beane, M. Young Doctors Struggle to Learn Robotic Surgery, So They Are Practicing in the Shadows. 2018. TheConversation.com

Beane, M. Robots add real value when working with humans, not replacing them. 2016. Techcrunch.com

Beane, M. Robo-sabotage is surprisingly common. 2015. MIT Tech Review

Beane, M. The avatar economy. 2012. MIT Technology Review.

INDUSTRY EXPERIENCE

TACITLY **Cambridge, MA**
Chief Executive Officer **May 2024**

Co-founder (with Juho Kim, CTO, KAIST). Tacitly's SkillBench platform helps experts and novices build skill through collaborative engagement with rich media (e.g., video) of skilled work that involves significant tacit knowhow – while also making that work human- and machine-readable.

HUMATICS **Cambridge, MA**
Chief Human-Robot Interaction Officer **2015-June 2017**

Founding executive for an MIT-connected startup building a new class of IoT sensor that provides hyper-precise, ultra-low-cost position data. Shaped strategy, co-raised 3m seed and 18m series A, led customer discovery for product-market fit, led business development, led a one-year DARPA project to develop the knowledge capture system for an airframe-agnostic robotic copilot.

iROBOT **Bedford, MA**
Strategy Consultant, Field Research Team Lead **2014 – 2015**

Led a team of five researchers on a six-month project to assess a potential new market for a semi-autonomous robotic telepresence system via situated, longitudinal study of human-robot interaction in an elder care facility. Delivered findings to CEO and his direct reports.

INTOUCH HEALTH **Santa Barbara, CA**
Design Consultant, Field Researcher **2014**

Provided research report on likely work implications/worker reactions to mobile, semi-autonomous robotic systems that include surveillance capability, including assessment of situated pilot testing in three west-coast hospitals.

ROGER SCHWARZ & ASSOCIATES **Chapel Hill, NC**
Principal Associate / Head of Sales and Marketing **2002 - 2010**

Revitalized a shrinking firm providing training, facilitation, coaching and consultation to globally-dispersed clients focused on fundamental, positive, sustained changes to organizational cultures. Crafted intellectual property core to the firm. Determined market direction and sales strategies. Led various intensive, long-term interventions to study and optimize group norms and culture.