

Matt Beane

Technology Management Program
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ACADEMIC POSITIONS

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

Massachusetts Institute of Technology, Research Affiliate, 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

In an age marked by reconfiguration of complex work through machine intelligence and robotics, I study how deviance arises and makes a difference in work and organizational life.

Broad Interests

Deviance; Technology and Organizing; Human-Robot Interaction; Sociology of Work; Coordination; 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

JOURNAL PUBLICATIONS

Beane, M. 2018. Shadow Learning: Building Robotic Surgical Skill When Approved Means Fail. *Administrative Science Quarterly* <https://doi.org/10.1177/0001839217751692>

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*

MANUSCRIPTS

Beane, M. “Making Grey Holes: How Organizations Enable Productive Deviance by Sacrificing Top Talent and Blocking Learning” [Dissertation, Under Review at *Organization Science*]

When deviance is required for reliable outcomes, how do organizations enable it yet fail to learn much from it? I explore these questions via qualitative and quantitative longitudinal comparison of robotic surgeries performed via two surgical robots at a top-tier teaching hospital. One robot was well-resourced and reliable and the other was underresourced and unreliable. To get acceptable results, surgical workers operated in deviant and ostensibly risky ways via the degrading robot. I show that workers and managers enabled this by making a “grey hole” - a work domain where success hinges on limited awareness of substandard conditions and methods. This required habituating top talent to slowly degrading conditions and was further stabilized by a discovery suppression cycle that blocked organizational learning about the trouble. Yet I show such learning is possible, as neither this nor its interstellar analogue is truly “black” - both expel information that reveals the scale of the phenomenon if not specifics on the dynamics within. By inducing a theory of grey holes, I show how productive deviance becomes effective and stable, why organizations fail to learn from it and reveal a new limit to returns on top talent.

Johnson, M., Beane, M., Mindell, D., Ryan, J. “Knowledge Management for Rapidly Extensible Collaborative Robots” [Under review at Transactions of Human-Robot Interaction]

It is difficult-but increasingly important-to build collaborative robots that can do a range of jobs in a range of ways in a range of conditions. Much of this difficulty stems from the broad scope of contextual and collaborative knowledge required to interact productively with humans amidst uncertainty and change. Generally, human-robot interaction (HRI) studies have made progress on related problems by constraining uncertainty and dynamism, thus limiting the knowledge required. Our participation in an extreme context prevented us from adopting these approaches: The Defense Advanced Research Projects Agency (DARPA) Aircrew Labor In-Cockpit Automation System (ALIAS) program has a requirement that the prototype robotic copilot system it seeks to develop must be extensible in 30 days to function in a different, unspecified aircraft in a range of flight conditions and missions. To accommodate, we developed a knowledge management-inspired approach and system that allowed a variety of stakeholders to curate and rely on a dynamic body of flight-related knowledge. This had significant positive implications across design, test and use of the system, crucially enabling pilots to compose a robot- and human-legible plan for their interaction with the system using familiar conventions. Our contributions promise to accelerate quality development of extensible collaborative robotic systems for settings such as general medical assistance, disaster response and construction that require collaborative problem solving in highly uncertain, dynamic and variable conditions.

WORKING PAPERS

Beane, M. “A Shady History: Expanding Surgical Practice through Communal Deviance from 1800-2017”

Beane, M. “User Acceptance of Mobile Autonomous Robots: Dueling Narratives Across the Uncanny Valley” [Data analysis and writing, to be submitted to Human-Robot Interaction (THRI, top journal)]

Beane, M. “What are Robots For? An Empirical Investigation of Robots’ Value as Signals, Symbols and Tools” [Writing, trans-ethnographic, to be submitted to THRI]

REFEREED CONFERENCES

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

2013 Accepted Paper, “Structuring Work in and around Organizations”, EGOS: Routes to Fractional Knowing: Evidence from Robotic and Phone-based Night Rounds in a Post-Surgical ICU, **Beane, M.**

INVITED TALKS/SERVICE

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 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 INTERESTS

Organizational Behavior, Technology and Organizing, Technology and Work, Technological Change, Deviance, The Business of Robotics, Teaming and Collaboration, Leadership, Organization Development, Research Methods

RECENT TEACHING EXPERIENCE

Teaching:

2014, 2015: The Business of Robotics. MIT Sloan.

Designed, administered and taught this intensive workshop for graduate and undergraduate students from across MIT. Sample panelists: Pete Wurman, CTO, Kiva systems, Charlie Grinnell, COO, Harvest Automation, Elaine Chen, VP Engineering, Rethink Robotics.

2011-2014: Distributed Leadership. MIT Sloan.

Taught a module in this highly-rated workshop-style MBA and Sloan Fellows course with Profs. Orlikowski, Malone and Ancona, redesigning a portion of the curriculum.

Teaching assistantships:

2015: Leading Complex Organizations, Prof. Nelson Repenning, Faculty Director, Executive MBA program. Capstone course involving intensive service projects with local non-profits.

2014, 2015: Leading Organizations, Hal Gregersen, Executive Director, MIT Leadership Center. Once in 2014 (Exec. MBA), twice in 2015 (Sloan Fellows and Exec. MBA). Assisted in course design.

2014: Organizations Lab, Prof. Nelson Repenning. Action-learning Executive MBA core course focused on improving a process in participants' organizations. Assisted in course design.

2014: Power, Influence and Negotiation, Prof. Jared Curhan. Executive MBA core course. Simulation and assessment-driven course.

2013: Leading in Uncertain Times, Profs. Ancona and Van Maanen. Executive MBA elective. Highly interactive, workshop-style course.

2013: Leadership Signature, Prof. Ancona. Sloan Fellows elective. Introspective, values and identity-focused, workshop-style course.

2013: Advanced Communication for Executives, Prof. Hartman. Executive MBA elective.

2011: Communications for Leaders, Prof. JoAnne Yates. Core Executive MBA course.

SAMPLE PRACTITIONER PUBLICATIONS

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. Beyond safety: is robotic surgery sustainable? 2015. Robohub.org.

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

RECENT INDUSTRY EXPERIENCE

HUMATICS

Chief Human-Robot Interaction Officer

**Cambridge, MA
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

Strategy Consultant, Field Research Team Lead

**Bedford, MA
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

Design Consultant, Field Researcher

**Santa Barbara, CA
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

Principal Associate / Head of Sales and Marketing

**Chapel Hill, NC
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.