Ian Roy

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EXECUTIVE DIRECTOR, BRANDEIS DESIGN AND INNOVATION (BDI)
ROBERT I. MALLET SENIOR LECTURER IN ENGINEERING AND BUSINESS

Innovative leader at the intersection of technology, education, and design, with over a decade of experience in digital fabrication, emerging technologies, and experiential learning. As Executive Director of Brandeis Design and Innovation (BDI) and an endowed faculty member in Engineering and Business, I focus on leveraging emerging technologies to drive research, interdisciplinary education, and social impact.

A builder of programs, spaces, and communities, I have founded and led multiple initiatives, including the Brandeis MakerLab, Automation Lab, Digital Scholarship Lab, 3D Printer Farm, and Engineering Classroom. Passionate about human-centered design, rapid prototyping, and non-zero-sum thinking, I advocate for mistake-driven learning, diverse collaboration, and applying designing to repair the world.

TECHNICAL EXPERTISE & RESEARCH INTERESTS

Rapid Prototyping & Digital Fabrication: CAD/CAM, 3D printing, CNC milling, laser cutting, electronics prototyping, machine modification, EHS policy, Culture of repair & training
Student Centered Entrepreneurship: Early stage startup ideation, Social Entrepreneurship, Field Projects
Makerspaces & Hackathons: Applied Design Thinking, space & event design
Drone Use & UAV Prototyping: FAA sUAS & EU Remote Pilot certification, Flight Planning, Drone Prototyping
3D Scanning & Landscape Mapping: Photogrammetry, Structured Light, LIDAR, Scale & Material variety
Policy & Ethics of Emerging Tech: Open-source hardware, licensing, tech equity

EDUCATION

Brandeis University (Class of 2005)
B.A. in Philosophy & Economics,
Concentration in Film Studies
Former Brandeis Ski Team Captain & Coach

CERTIFICATIONS & AFFILIATIONS

- Board Member, Racial Justice x Tech Policy (RJxTP)
- Board Member, Weston Art & Innovation Center
- e-NABLE Open-source Hardware - Education Lead
- Apple Certified Macintosh Technician (ACMT)
- Amateur Radio Operator Class License (Technician)
- FAA sUAS and EU Remote Pilot License (Drone Operations)

KEY INITIATIVES & IMPACT

- Project lead in developing both the **Research Technology department (RTI)** and the **Design and Innovation department (BDI)**. In 2014, he was the **Founding Head of the Brandeis MakerLab**, and in 2018 he was the first **Head of the Digital Scholarship Lab**.
- **Brandeis Design & Innovation (BDI) Ecosystem:** Established a cross-campus network of spaces, courses, and research opportunities that blend design, emerging tech, and social impact.
- Brandeis Engineering Program: **Co-designed and launched Brandeis' first engineering classroom and course**, integrating design thinking, digital fabrication, and systems-level problem-solving.
- **DeisHacks** (Social Impact Hackathon): **Co-founded Brandeis' flagship social justice hackathon,** which has run annually for the last 8 years, where students apply design thinking to real-world nonprofit challenges, fostering solutions in education, healthcare, sustainability, and equity.
- Ran an **annual department budget of ~$500k a year for >10 years**: 4 FTEs and 14 student workers.
- Technical Lead on many capital projects: $25k Build out of **Research Technology department (2013),** $30k build out of **Brandeis MakerLab (2014)**, $50k build out of **Digital Scholarship Lab (2018)**, $100k build out of **Automation Lab (2020), Farber 101 Innovation Classroom** ($100K Budget), **Goldfarb 230 Digital Humanities Classroom** ($160k Budget), $1m build out of **first Engineering Classroom (2023)**
- **e-NABLE & NIH 3D Exchange**: Helped redesign the NIH 3D Print Exchange, expanding access to open-source prosthetics through improved sorting and filtering tools. (3 grant funded internships totaling ~$10k)
- **Policy & Advocacy:** Board member at **Racial Justice x Tech Policy (RJxTP)** and the **Weston Art & Innovation Center**, promoting equitable access to emerging technologies.

PROFESSIONAL EXPERIENCE

Brandeis University | Waltham, MA

Executive Director, Design and Innovation (BDI) (2024–Present)

- Lead Brandeis Design and Innovation (BDI), managing multiple maker spaces, emerging technology hubs, and digital scholarship initiatives across campus.
- Oversee strategic planning, operations, and integration of emerging technologies into research and education.
- Develop and implement programs in CAD/CAM, 3D scanning, XR development, machine learning, robotics, drone design, and embedded systems.
- Champion policy discussions on the social, ethical, and political implications of technology in higher education.
- Partner with faculty, researchers, and industry leaders to advance interdisciplinary, experiential learning opportunities.

Robert I. Mallet Senior Lecturer in Engineering and Business (2025–Present)

- Teach three courses annually in Engineering, Business, and Anthropology with a focus on:
  - Human-centered design & rapid prototyping (ENGR11A)
  - Entrepreneurship & startup methodologies (BUS233A)
  - Digital fabrication with robotics (BUS232F)
- Developed Brandeis' first Engineering course and active learning classroom, integrating CAD/CAM workflows into an interdisciplinary engineering curriculum.
- Advocate for diversity in problem-solving, emphasizing that diverse perspectives drive better design and innovation outcomes.

F**ounding Head, Brandeis MakerLab & Digital Scholarship Lab (2014–2023)**

- "Supporting educational, social and technological innovation, the Brandeis MakerLab is oriented around a vision of social justice designed to support makers who mend. We collaborate on computing projects to develop new forms of culture and craft in a community-centered setting."
- Went from 0 to 100+ 3D Printers in two years.
- Built a culture of Hackathons at Brandeis. Hosted or judged the first eleven 24-hour hackathons at Brandeis, helping create the Printathon and Codestellation brands. In 2018, Co-founded the DeisHacks hackathon, an applied social justice hackathon partnered with the Brandeis International Business School.
- Took Brandeis from one technology student club to more than 10. Helped charter, found, and advise the Brandeis 3D Printing Club, Aviation Club, Prosthesis Club, VR Club, Robotics Club, Experimental Archeology Club.
- Built the MakerInResidence Program, Community Maker Program, Impact Maker Program, and Environmental Impact Maker Programs to fund inspirational local projects beyond our staffing abilities. Approximately 12 teams of 50-75 people yearly since 2014.
- Developed partnerships with corporations to support engineering tools: Autodesk, Formlabs, Dassault Systems, 52 Launch, 3D Print Life, G-Tek Labs, Boston Children's Museum, Deep Core Data, Artisan's Asylum, Aerial Sports League, E3D, Simplify3D
- During the Covid19 Pandemic, led 52 weeks of virtual meetings for MakerSpace best practices for pandemic response with 20+ peer institutions. Helped scale up PPE production and introduced a literacy guide.

Director, Research Technology & Innovation (RTI) (2015–2023)

- Leads the team that built, and currently oversees and provides strategic vision for the MakerLab, Automation Lab, and Digital Scholarship Labs.
- Supports four toolsets across campus: Digital Fabrication, 3D Scanning, XR (VR/AR), and Robotics.
- 1 in 4 students will use RTI services while they are at Brandeis between the MakerLab, Automation Lab, and Digital Scholarship Lab, through a workshop, class, club, or event.
- RTI hosts 90+ workshops yearly across the 3 labs, with 500+ participants.
- Directs the development, planning, evaluation, and management of the strategic vision for research support.
- Creates and enables an environment that facilitates innovative thought about the future of research technologies as well as the use of emerging research technologies across disciplines.
- Engages with faculty and researchers to cooperatively determine and support current and future needs, and to establish strategic plans for research technology service delivery.
- Builds, develops, and supports a diverse and effective team of Research Systems Specialists.
- Supports technology needs within research and lab environments that exist between the typical end user desktop environment and the lab / high-performance computing / MakerSpace environment.
- Technical Lead designing the requirements for the Farber 101 Innovation Classroom ($100K Budget), Goldfarb 230 Digital Humanities Classroom ($160k Budget).

TEACHING AND COURSES

ENGR11A: ***Introduction to Design Methodologies*** (co-taught with Ben Rogers) - *Started Fall 2023, 4 credits*
An introduction to the engineering design process, with a focus on human-centered design. Students work in teams to solve authentic design problems under the theme of "Design to repair the world". Students are guided through a highly scaffolded process in which they form an idea, sketch it, and develop it through multiple iterations leveraging quick feedback loops and the Design Thinking methodology. We will start with a focus on CAM (computer aided manufacturing), and move to a focus on CAD (computer aided design).

BUS297C: Leadership Internships in Social Impact Organizations (continuing the work of Gene Miller)
Started Spring 2023 semester commitment, 2 credits per semester
In this graduate level business course, students embed on the boards of local nonprofit organizations from August through May. The course is a mix of theory taught through case study and guest lectures, and hands on design challenges focused on solving real world problems for the board. The board fellows curate the challenges from the nonprofits to bring to Brandeis' annual hackathon DeisHacks so that teams of students can "Hack" novel solutions that then get implemented by the board fellow to make real organizational impact that effects our local communities.

BUS233A: ***Entrepreneurship & Rapid Prototyping*** (co-taught with Aldo Musacchio) - *Started Spring 2019, 4 credits*
This course focuses on prototyping/lean startup, minimum-viable products, design thinking, project management, and product/service development. Today, the most important skills entrepreneurs need to have are not necessarily learned in the traditional classroom environment. The work of an entrepreneur and project manager of any kind requires mastering the art of rapid experimentation/prototyping with multiple iterations to improve systems, products or services. This course is designed to allow students learn those tools in a hands-on, immersive approach, allowing students to launch one actual product or service in the course of a semester.

ANTH129A: ***Culture in 3D: Theory, Method, and Ethics for Scanning and Printing the World***
(co-taught with Charles Golden) - *Started Fall 2018, 4 credits*
Designed to train students in the methods needed for the successful application of 3D modeling and printing for the documentation, conservation, and dissemination of cultural patrimony. Students will acquire the technical skills and engage in the ethical debates surrounding ownership and reproduction of such patrimony.

BUS232F: ***Digital Fabrication with Robotics*** - *Started Fall 2017, 2 credits*
The goal of this course is for students to walk away with the ability to imagine a design and produce it in physical reality. Students will learn the fundamental underlying technologies in digital fabrication, 3D scanning, 3D design, and robotics. Through a combination of real world examples and hands on experiences, students will learn to take a design from concept to reality. There will be a focus on literacy of underlying technologies: how things work, what their limitations are, why they fail, and how to troubleshoot or design around those limitations.

SELECTED GRANTS AND AWARDS

2023-2025 e-NABLE Loomio Grant, $8,000 over 4 interns *"e-NABLE internship to update NIH3D content"*, Ian Roy to hire student interns
2021 NEH Prototype Grant funding $50,000, leading to NEH Production Grant Funding $300,000 "Boston's Hidden Sacred Spaces" Michael Cohen, Wendy Cadge, Ian Roy
2016 Brandeis Provost Award, $20,000, "Mouliana Project | A History of the Western Siteia Foothills of Crete" Andrew Koh, Ian Roy
2015 US Army Research Office, $15,000 sub award, "*The Western Jihadism Data Collection: Tracking 20 Years of Al Qaeda-Inspired Terrorist Offenders and Incidents." (*PI: Jytte Klausen, Brandeis University) W911NF1510097

SELECTED PUBLICATIONS & CONFERENCE PROCEEDINGS

Journal Papers

- **Tynes, J., & Roy, I. (2022).** *CHEX Sponsored Workshop Series: Cultivating Standards for Immersive Learning Environments through Design.* **Practitioner Proceedings of the 8th International Conference of the Immersive Learning Research Network (iLRN2022)**.
- **Koh, A. J., Birney, K., & Roy, I. (2020).** *The Mycenaean Citadel and Environs of Desfina-Kastrouli: A Transdisciplinary Approach to Southern Phokis.* **Mediterranean Archaeology and Archaeometry.**
- **Beltrame, E., Tyrwhitte-Drake, J., Roy, I., Shalaby, R., Suckale, J., Krummel, D. (2017).** *3D Printing of Biomolecular Models for Research and Pedagogy.* **Journal of Visualized Experiments (JoVE).**

Conference Presentations & Invited Talks

- Roy, I. *"Liberal Technology: Bridging the Arts, Sciences and Business to Innovate in a Connected World"* **Community Research Seminar at Olin College (December 2024)**
- Roy, I. & Tynes, J. "*CHEX Sponsored Workshop Series: Cultivating Standards for Immersive Learning Environments through Design".* **8th International Conference of the Immersive Learning Research Network (iLRN2022).**
- Jordan Tynes, Ian Roy, Maritina Keleri, *"All Conference Workshop Series: Using Design Thinking to Develop Standards for Immersive Learning Environments: Technical, Narrative, Engagement, and Creative aspects"*, **iLRN 2022 Vienna, Austria**
- Ian Roy, Hazal Uzunkaya, Tim Hebert, *"Five hands on 3D Scanning Experiences for k-12"*, **Boston Created By Festival 2021, Boston Children's Museum**
- Ian Roy, Jordan Tynes, *"Making Makers: Centers for Innovative Learning and Research"*, **The Horizons Series, Colgate University, September 29, 2021**
- Ian Roy, Jordan Tynes *"Making Makers: Students at the Center of Education, Technology, and Innovation",* **ELI Annual Conference, 2018**
- Douglas Higgins, Ian Roy, Jordan Tynes, Ahmad Khazaee, "*Teaching, Learning, and Research with Emerging Technologies: Guided Discussions of Strategies"*, **ELI Annual Conference, 2018**
- Douglas Higgins, Ian Roy, Jordan Tynes, Ahmad Khazaee Pre-Conference Workshop: "*The Role of Emerging Technologies in Higher Ed: Impacts on Teaching, Learning, and Research",* **ELI Annual Conference, 2017**
- Ian Roy, Hazal Uzunkaya, Tim Hebert, *"Emerging Technology on Campus: MakerSpace Project Showcase with Brandeis"*, **Boston Mini MakerFaire, 2017**
- Ian Roy, Jordan Tynes, Douglas Higgins, Lucian Chapar, *"Instilling a Maker Mindset on Campus: Case Studies and projects from the student perspective"*, **World MakerFaire NY, 2017**
- Ian Roy, *"The Evolution of FPV Drone Racing: trends, and what has changed in the last year" by Brandeis MakerLab"*, **Colgate University Dronefest, 2017**
- Ian Roy, Tim Hebert, *"Flight Plans – What should they look like" by Brandeis University MakerLab"*, **Colgate University Dronefest, 2017**
- Ian Roy, Jordan Tynes, *"How to Pack a Mobile Makerspace: Digital Fabrication Workflows in Support of Faculty Field Research"*, **ELI Annual Conference, 2017**
- Douglas Higgins, Ian Roy, Jordan Tynes, Ahmad Khazaee, Poster Session: *"Virtual Reality and Emerging Tech Playground: The Role of Emerging Technologies in Higher Education"*
- Douglas Higgins, Ian Roy, Jordan Tynes, Lucian Chapar, MakerFaire Main Stage: *"Instilling a Maker Mindset on Campus: Case Studies"*, **World Maker Faire New York 2016**
- Ian Roy, Tim Hebert, *"FPV Drone Racing intro and overview"*, **DroneFest at Colgate University, 2016**
- Douglas Higgins, Ian Roy, Jordan Tynes, Ahmad Khazaee, *"Spaces for Making: Case Studies in Development, Support, and Practical Workflows for Digital Fabrication"*, **NERCOMP 1 day PDO at Holy Cross, 2016**
- Ian Roy, *"New Perspectives: Instilling a 'Maker' Mindset with Makerspaces"*, **Next Generation Learning Spaces Atlanta, GA, 2016**
- Douglas Higgins, Ian Roy, Jordan Tynes, *"Evolution of the Learning Space: Making and 3D Printing to Drive Innovation"*, **ELI Annual Meeting, 2016**
- Ian Roy, Tim Hebert "How to DIY a Drone", **DroneFest at Colgate University, 2015**
- Ian Roy, Tim Hebert, Hazal Uzunkaya, "*3D Printing Use Cases in Higher Education"*, **NERCOMP 1 day PDO in Norwood**, MA on June 11, 2015 Hosted by Bryan Alexander.
- Rebecca Darling, Ian Roy, Jordan Tynes, *"The Idea Exchange: Maker Spaces in Higher Ed",* **NERCOMP Annual Conference, 2015**

VOLUNTEER EXPERIENCE

Charles River Museum of Industry and Innovation, Waltham, MA (June 2017 -Present)
Board of Directors, Education Committee
Hosts intro to drones workshops and 3D Printer trainings

Weston Arts and Innovation Center, Weston, MA (June 2021 - Present)
Board of Directors, Executive Committee, Programming Committee
Taught week long summer program on 3D printing + 3D Scanning for teens

Racial Justice x Tech Policy (RJxTP), Brandeis Heller School (June 2022 - Present)
Board Member, Leader of Process Subcommittee
Build out Project Management tool for the full board
Lead Board Retreat on Design Thinking Exercises focusing on Mission and Strategy

e-NABLE.org 3D Printed Prosthesis (June 2022 - Present)
Enable Education Leader
Redesigning the NIH 3D Print Exchange's Prosthesis section

Boston Police Academy, Somerville, MA (July 2018 - Present)
Boston Police Teen Academy (BPTA) Teen Program Yearly Drone Summer Workshop

Prospect Hill community center (urban gardening, workshops with youth)
Waltham HS Engineering Club (3D printed rockets and Drones)
Waltham HS 3D Printing Club (3DP training, machine purchase and setup consultation)
Rat MRI accessories for a **Harvard Medical School** research group
Consultation with **UMASS Boston** on building out a 3DP program
Consultation with **UMASS Amherst** on building out their MakerBot Innovation Center
Work with **UMASS Medical Worcester** to 3D scan kidney and bladder stone collection
Consultation with **Lesley University** on building out a 3DP program
Tabled at and Won "Best in Class for Education" Blue Ribbon at **NY World MakerFaire 2016**
Official Event Partner for **Created By Festival 2020, 2021, 2022, 2023** @ **Boston Children's Museum**

As part of BUS297 class and DeisHacks 2025, **negotiated 9 month placements of students on boards of:**
e-NABLE https://enablingthefuture.org/
Charles River Museum https://www.charlesrivermuseum.org/
Opportunities for Inclusion https://www.oppsforinclusion.org/
The Loop Lab https://www.thelooplab.org/
Waltham Chamber of Commerce https://www.walthamchamber.com/
Charles River Community Health https://www.charlesriverhealth.org/
Community Day Center of Waltham https://www.communitydaycenter.org/
Haven Project https://havenproject.net/
Hope Worldwide https://www.hopeww.org/
Project Insulin https://projectinsulin.org/
Weston AIC (art and innovation) https://westonaic.org/
Communiversity http://comuniversity.org/
Brandeis International Business School https://www.brandeis.edu/global/
Waltham Boys and Girls Club https://walthambgc.org/