David Bennett, Ph.D.

Electrical Engineer | Software/Systems Engineer | MRI Physicist & Imaging Scientist | Educator
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SUMMARY

PhD scientist and engineer with a career spanning four interconnected identities: electrical/software engineer, MRI physicist and imaging scientist, entrepreneur, and educator. Began as a software/systems engineer (MIT Lincoln Laboratory, MITRE, Goodrich) programming embedded systems in C and assembly, then moved into MR physics within a Biomedical Engineering PhD. Founded and served as CEO of a small-animal RF coil company during a postdoctoral fellowship. Spent 20+ years as an MRI physicist and imaging scientist across academic medical centers and pharmaceutical drug development, including hands-on hardware systems engineering, quantitative imaging biomarker strategy, regulatory documentation, and clinical trial leadership across oncology, immunology, and cardiovascular disease. In parallel, has taught continuously across every career stage, from undergraduate peer tutoring through a six-year adjunct professorship (including designing an original online graduate course), secondary STEM/robotics instruction, and MRI board exam tutoring. Recently completed an MIT certificate in Applied AI and Data Science. Previously held a TS/SCI security clearance; U.S. citizen.

CORE COMPETENCIES

- **Electrical & Systems Engineering:** Embedded systems (C, assembly), RF coil design, RF/gradient hardware integration, systems verification and performance evaluation, circuits, controls, signal processing
- **MRI Physics & Imaging Science:** Electromagnetics, quantum mechanics of nuclear spin, quantitative MRI methods (MR elastography, MR enterography, PC-MRI, PDFF, DWI, MRS, manganese-enhanced MRI), preclinical and clinical protocol design (4.7T–9.4T and clinical field strengths), PET-adjacent/multi-modality imaging
- **Clinical Trial & Regulatory Leadership:** Imaging biomarker/endpoint strategy, BICR charter authorship, imaging CRO and core lab governance, FDA briefing document authorship, GCP compliance, RECIST 1.1/Lugano/PCWG2 tumor response criteria
- **Scientific Computing & AI:** MATLAB (extensive), Python, C; AI-assisted imaging algorithm validation; MIT Applied AI and Data Science certificate
- **Teaching & Curriculum Design:** Original graduate course design and delivery, secondary STEM/engineering/robotics instruction, one-on-one and small-group tutoring, board exam preparation, biomedical research ethics instruction
- **Leadership & Entrepreneurship:** Founder/CEO experience; cross-functional program leadership; mentoring of scientists, engineers, and students

PROFESSIONAL EXPERIENCE: IMAGING SCIENCE AND PHARMA

Director, Clinical Imaging | AstraZeneca, Waltham, MA | Jan 2025 – Sep 2025
- Directed imaging biomarker strategy for global Phase II/III inflammation trials in IBD and early-stage rare liver disease.
- Authored an FDA briefing document for an early-stage primary sclerosing cholangitis (PSC) study proposing MR elastography and gadoxetate-enhanced MRI as imaging endpoints.
- Authored imaging acquisition guidelines, central read charters, and reader training materials; governed imaging CRO performance and data quality.

Associate Scientific Director, Imaging | Takeda Pharmaceuticals, Cambridge, MA | Jun 2020 – Jul 2024
- Led imaging strategy for a Phase 3 cell therapy program in perianal fistulizing Crohn's disease in which the MRI-based central imaging read served as a co-primary endpoint.
- Led imaging endpoint strategy for GI and inflammation pipelines using MR Elastography and PC-MRI.
- Participated in validation of an AI-assisted imaging algorithm for regulatory-grade clinical IBD readout.

- Co-led academic and industry collaborations validating PET radiotracers in liver fibrosis and fibrostenotic Crohn's disease.

Associate Director, Imaging Science | Parexel Informatics (now Perceptive), Billerica, MA | Apr 2014 – Jun 2020
- Served as oncology imaging scientific lead (5 of 6 years); implemented RECIST 1.1, Lugano, and PCWG2 tumor response criteria across dozens of global multi-center trials.
- Authored BICR charters, independent review methodology, and standardized multi-modality (CT, MRI, PET/CT) acquisition guidelines; managed imaging CRO and core lab operations.
- Collaborated with data scientists and engineers to develop and validate proprietary image-processing tools; resolved imaging non-conformances in sponsor-facing audits.

MRI Research Engineer & Lab Manager | Beth Israel Deaconess Medical Center / Harvard, Boston, MA | Nov 2012 – Apr 2014
- Designed and executed preclinical MRI studies on Bruker 4.7T, 8.5T, and 9.4T systems; developed diffusion tensor and perfusion imaging protocols.

Senior Scientist | Pfizer, Inc., Andover, MA | Nov 2010 – Nov 2012
- Designed and validated preclinical cardiac MRI and MR spectroscopy protocols at 7T; proposed in vivo MRS liver lipid quantification as a first-in-human clinical endpoint.

MRI Physicist / Systems Engineer | Aurora Imaging Technology, Inc., North Andover, MA | Jun 2008 – Nov 2010
- Systems engineer for a dedicated breast MRI platform: RF/gradient hardware-software integration, performance verification, SNR/uniformity characterization, breast PET-MRI detector integration with Brookhaven National Laboratory.

PROFESSIONAL EXPERIENCE: ENGINEERING AND ENTREPRENEURSHIP

Founder & CEO | Small-Animal RF Coil Company | 2007 – 2008
- Founded and led a small-animal RF coil company during postdoctoral training at McLean Hospital.

Postdoctoral Research Fellow | McLean Hospital / Harvard Medical School, Belmont, MA | Jun 2007 – Jun 2008
- Acquired and optimized clinical proton MRS data on a 4T Varian scanner; developed imaging biomarkers for preclinical psychiatric research at 9.4T.

Software / Systems Engineer | MITRE and Goodrich | about 5 years, early career
- Programmed embedded systems in C and assembly language at MITRE; C and MATLAB at Goodrich.
- Held a TS/SCI security clearance during MITRE tenure (1999).

TEACHING EXPERIENCE

Adjunct Professor, General Physics | Merrimack College | Fall 2026 – present
- Teaching one section of General Physics for non-majors and managing the corresponding laboratory section.

Adjunct Professor | University of Massachusetts Lowell | 2012 – 2018
- Created and taught an original online graduate-level course in MRI physics.
- Taught the in-person graduate course BMBT.5200, Ethical Issues in Biomedical Research.

STEM Teacher | Methuen High School, Methuen, MA | Sep 2024 – Jan 2025
- Taught 3 sections of CP Engineering and 2 sections of Honors Robotics (VEX); earned Massachusetts MTEL certification (provisional license), Engineering and Technology (2024).

MRI Board Exam Tutor | Online Platform | Oct – Dec 2025
- Tutored MRI technologist board exam candidates; built a free AI-assisted online MRI physics simulator to help students learn more efficiently.

Invited Lecturer, MRI Physics | Dartmouth College, Hanover, NH | Spring 2013
- Delivered a guest lecture on core MRI physics to an interdisciplinary graduate academic audience.

Peer Tutor | Centers for Learning, University of Massachusetts Lowell | 1994 – 1997

- Tutored College Algebra, Engineering Calculus I–III, and Engineering Physics I–III throughout undergraduate EE studies.

EDUCATION AND LICENSURE

- **Ph.D., Biomedical Engineering**, Worcester Polytechnic Institute. Dissertation: "Osmotic- and Stroke-Induced Blood-Brain Barrier Disruption Detected by Manganese-Enhanced MRI"
- **M.S., Electrical Engineering**, University of Massachusetts Lowell. Project: 3D object classification using Hidden Markov Models
- **B.S., Electrical Engineering (cum laude)**, University of Massachusetts Lowell
- **Certificate, Applied AI and Data Science**, Massachusetts Institute of Technology (completed August 2026)
- **Massachusetts Provisional License**, Technology/Engineering (MTEL passed, 2024)

SELECT PUBLICATIONS

- Kumar S., Bhagwanani A., Hameed M., Rao N., Parry T., Rahman S., Bennett D., et al. Volumetric measurement of terminal ileal Crohn's disease by magnetic resonance enterography: a feasibility study. *European Radiology* 35(1):117–126 (2024).
- Polizzotti BD, Ganapathy B, Walsh S, Choudhury S, Ammanamanchi N, Bennett DG, et al. Neuregulin stimulation of cardiomyocyte regeneration in mice and human myocardium reveals a therapeutic window. *Science Translational Medicine* 7:281ra45 (2015).
- Ganapathy B., Polizzotti B., Bennett D., et al. Neuregulin-1 administration protocols sufficient for stimulating cardiac regeneration in young mice do not induce somatic, organ, or neoplastic growth. *PLOS ONE* 11(5):e0155456 (2016).
- Herter-Sprie GS, Korideck H, Christensen CL, et al. Image-guided radiotherapy platform using single nodule conditional lung cancer mouse models. *Nature Communications* 5:5870 (2014).
- Querol M., Bennett D.G., Sotak C.H., Bogdanov A.A. Jr. A paramagnetic contrast agent for detecting tyrosinase activity. *Chembiochem* 8(14):1637–41 (2007).
- Full publication list and conference abstracts available upon request.