Eric Gibbons

CONTACT INFORMATION	Department of Electrical and Computer Engineering 1447 Edvalson St. Dept. 1803 Ogden, Utah 84408	ericgibbons@weber.edu (801) 626-6898 `faculty.weber.edu/ericgibbons`

RESEARCH INTERESTS

My research focuses on magnetic resonance physics and image formation, with the goal of improving the quality of magnetic resonance imaging (MRI). This work spans MR physics, biophysics, RF pulse design, image reconstruction algorithms, machine learning, and clinical implementation.

EDUCATION

Stanford University, Stanford, California, USA

Ph.D. Bioengineering, June 2017
- Minor: Electrical Engineering
- Advisor: John Pauly
- Dissertation: *Robust Body Diffusion Magnetic Resonance Imaging*

M.S. Bioengineering, June 2013

University of Utah, Salt Lake City, Utah, USA

B.S. Biomedical Engineering, May 2011
- Minor: Mathematics

POSITIONS

Weber State University, Ogden, Utah USA

Associate Professor, Department of Electrical and Computer Engineering, 2025–Present
Assistant Professor, Department of Electrical and Computer Engineering, 2019–2025

University of Utah, Salt Lake City, Utah USA

Postdoctoral Research Associate, Department of Radiology, 2017–2019

AWARDS

- NIH T32 Cardiovascular Imaging Training Grant, 2017
- ISMRM Educational Stipend Award, 2013, 2014, 2015, 2016
- National Science Foundation Graduate Research Fellowship, 2012
- Stanford University School of Engineering Dean's Doctoral Diversity Fellowship, 2011
- University of Utah College of Engineering Arel Berrier Scholarship, 2010
- University of Utah Presidential Scholarship, 2005 - 2011
- Member of Tau Beta Pi, 2009 - Present
- Eagle Scout, 2003

PUBLICATIONS

[1] A. S. Chaudhari, K. J. Stevens, J. P. Wood, A. K. Chakraborty, **E. K. Gibbons**, Z. Fang, A. D. Desai, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Utility of deep learning super-resolution in the context of osteoarthritis mri biomarkers," *Journal of Magnetic Resonance Imaging*, vol. 51, no. 3, pp. 768–779, 2020.

[2] **E. K. Gibbons**, K. K. Hodgson, A. S. Chaudhari, L. G. Richards, J. J. Majersik, G. Adluru, and E. V. DiBella, "Simultaneous NODDI and GFA parameter map generation from subsampled q-space imaging using deep learning," *Magnetic Resonance in Medicine*, vol. 81, no. 4, pp. 2399–2411, 2019.

[3] A. S. Chaudhari, Z. Fang, F. Kogan, J. Wood, K. J. Stevens, **E. K. Gibbons**, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Super-resolution musculoskeletal MRI using deep learning," *Magnetic Resonance in Medicine*, vol. 80, no. 5, pp. 2139–2154, 2018.

[4] **E. K. Gibbons**, S. S. Vasanawala, J. M. Pauly, and A. B. Kerr, "Body diffusion-weighted imaging using magnetization prepared single-shot fast spin echo and extended parallel imaging signal averaging," *Magnetic Resonance in Medicine*, vol. 79, no. 6, pp. 3032–3044, 2018.

[5] **E. K. Gibbons**, P. Le Roux, S. S. Vasanawala, J. M. Pauly, and A. B. Kerr, "Robust self-calibrating nCPMG aquisition: Application to body diffusion-weighted imaging," *IEEE Transactions on Medical Imaging*, vol. 37, no. 1, pp. 200–209, 2018.

[6] **E. K. Gibbons**, P. Le Roux, J. M. Pauly, and A. B. Kerr, "Slice profile effects on nCPMG SS-FSE," *Magnetic Resonance in Medicine*, vol. 79, no. 1, pp. 430–438, 2018.

[7] **E. K. Gibbons**, P. Le Roux, S. S. Vasanawala, J. M. Pauly, and A. B. Kerr, "Body diffusion weighted imaging using non-CPMG fast spin echo," *IEEE Transactions on Medical Imaging*, vol. 36, no. 2, pp. 549–559, 2017.

CONFERENCE
PROCEEDINGS

[1] **E. K. Gibbons**, J. Mendes, and E. V. R. DiBella, "Residual neural network simultaneous cardiac $T_{1\rho}$ and T_2 mapping using a combined spin echo, spin lock pulse sequence," in *Proceedings of International Society for Magnetic Resonance in Medicine, 32nd Annual Meeting, Honolulu, Hawaii, USA*, 2025, p. 1830.

[2] A. S. Chaudhari, B. Gunel, B. Ozturkler, P. Adamson, Z. Fang, R. Heckel, **E. K. Gibbons**, G. E. Gold, B. A. Hargreaves, S. Vasanawala, J. M. Pauly, and A. Desai, "Mitigating data paucity and distributional shifts for accelerated MRI alongside new clinically-relevant evaluation metrics," in *Proceedings of Biomedical and Astronomical Signal Processing Frontiers, Villars-sur-Ollon, Switzerland*, 2023, p. 28.

[3] **E. K. Gibbons**, Z. Fang, A. D. Desai, C. M. Sandino, G. E. Gold, B. A. Hargreaves, and A. S. Chaudhari, "Benchmarking accelerated MRI: a head-to-head comparison of deep learning reconstruction and super-resolution techniques," in *Proceedings of International Society for Magnetic Resonance in Medicine, 29th Annual Meeting, London, United Kingdom*, 2022, p. 1873.

[4] **E. K. Gibbons**, A. S. Chaudhari, G. Adluru, and E. V. R. DiBella, "Rapid myocardial perfusion mri reconstruction using deep learning networks," in *Proceedings of International Society for Magnetic Resonance in Medicine, 27th Annual Meeting, Sydney, Australia*, 2020, p. 7047.

[5] **E. K. Gibbons**, K. K. Hodgson, A. S. Chaudhari, L. G. Richards, J. J. Majersik, G. Adluru, and E. V. R. DiBella, "Deep learning for DSI parameter map generation without image pre-processing," in *Proceedings of International Society for Magnetic Resonance in Medicine, 27th Annual Meeting, Montreal, Canada*, 2019, p. 3359.

[6] A. S. Chaudhari, Z. Fang, **E. K. Gibbons**, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Super-resolution enhances morphological and quantitative MRI on prospectively-sampled low-resolution data," in *Proceedings of Medical Imaging Meets NIPS, 32nd Conference on Neural Information Processing Systems, Montreal, Canada*, 2019.

[7] A. S. Chaudhari, Z. Fang, F. Kogan, J. Wood, K. J. Stevens, **E. K. Gibbons**, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Using artificial intelligence to enhance MRI efficiency for imaging OA," in *International Workshop on Osteoarthritis Imaging, Menton, France*, 2018.

[8] E. V. R. DiBella, **E. K. Gibbons**, J. Mendes, Y. Tian, and G. Adluru, "Using artificial intelligence to transform cardiac MRI reconstruction methods," in *Engineering in Medicine and Biology Society (EMBC), 2018 Annual International Conference of the IEEE*, 2018.

[9] **E. K. Gibbons**, A. S. Chaudhari, and E. V. DiBella, "Deep slice: expanding cardiac SMS coverage through deep learning slice interpolation," in *Proceedings of International Society for Magnetic Resonance in Medicine, 26th Annual Meeting, Paris, France*, 2018, p. 3514.

[10] A. S. Chaudhari, Z. Fang, F. Kogan, J. Wood, K. J. Stevens, **E. K. Gibbons**, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Enhancing MRI resolution and fully-automating tissue segmentation using deep learning," in *Proceedings of the Nvidia GPU Technology Conference (GTC), San Jose, California, USA*, *Best poster award.

[11] **E. K. Gibbons**, A. S. Chaudhari, and E. V. R. DiBella, "Expanding SMS coverage in cardiac perfusion MRI through deep learning for temporal interpolation," in *Proceedings of the ISMRM Workshop on Machine Learning, Pacific Grove, California, USA*, 2018.

[12] A. S. Chaudhari, Z. Fang, F. Kogan, J. Wood, K. J. Stevens, **E. K. Gibbons**, J. H. Lee, G. E. Gold, and B. A. Hargreaves, "Deep-learning-based super-resolution and segmentation for clinical and research musculoskeletal MRI," in *Proceedings of the ISMRM Workshop on Machine Learning, Pacific Grove, California, USA*, 2018.

[13] **E. K. Gibbons**, P. LeRoux, S. Vasanawala, J. M. Pauly, and A. B. Kerr, "Robust nCPMG SS-FSE with accelerated acquisition and reconstruction," in *Proceedings of International Society for Magnetic Resonance in Medicine, 25th Annual Meeting, Honolulu, Hawaii*, 2017, p. 3514.

[14] **E. K. Gibbons**, J. M. Pauly, and A. B. Kerr, "Slice profile effects on non-CPMG SS-FSE acquisitions," in *Proceedings of International Society for Magnetic Resonance in Medicine, 24rd Annual Meeting, Singapore, Singapore*, 2016, p. 1894.

[15] **E. K. Gibbons**, S. S. Vasanawala, J. M. Pauly, and A. B. Kerr, "Body DWI using nCPMG FSE," in *Proceedings of International Society for Magnetic Resonance in Medicine, 23rd Annual Meeting, Toronto, Canada*, 2015, p. 2540.

[16] **E. K. Gibbons**, J. M. Pauly, and A. B. Kerr, "Single-shot isotropic diffusion weighting with eddy current compensation," in *Proceedings of International Society for Magnetic Resonance in Medicine, 22nd Annual Meeting, Milan, Italy*, 2014, p. 2559.

[17] **E. K. Gibbons**, J. M. Pauly, M. Saranathan, B. Rutt, and A. B. Kerr, "A T2-diffusion-prepared cube sequence for brain lesion detection at 7T," in *Proceedings of International Society for Magnetic Resonance in Medicine, 21st Annual Meeting, Salt Lake City, Utah, USA*, 2013, p. 2512.

[18] **E. K. Gibbons**, S. J. Holdsworth, M. Aksoy, M. B. Ooi, and R. Bammer, "Analysis of ghosting artifacts for real-time motion correction using EPI," in *Proceedings of International Society for Magnetic Resonance in Medicine, 20th Annual Meeting, Melbourne, Australia*, 2012, p. 3431.

[19] C. Petty, **E. K. Gibbons**, R. A. Normann, and G. A. Clark, "Containment for the Utah Slanted Electrode Array," in *5th Annual Mountain West Biomedical Engineering Conference*, 2009.

TEACHING
EXPERIENCE

Weber State University, Department of Electrical and Computer Engineering

ECE 1270: Introduction to Electrical Circuits
ECE 1400: Fundamentals of Engineering Computing
ECE 2260: Fundamentals of Electrical Circuits
ECE 3210: Signals and Systems
ECE 3430: Engineering Probability and Statistics
ECE 5210: Digital Signal Processing
ECE 5220: Image Processing

Stanford University, Department of Electrical Engineering

EE 102A: Signals and Systems (Instructor of record and TA)
EE 369B: Medical Imaging Systems II (TA)
EE 369C: Medical Imaging Reconstruction (TA)
EFS/Lang 688: Writing for Engineering and Sciences (TA)

University of Utah, Department of Bioengineering

BIOEN 3900: Biosignals Analysis (TA)
BIOEN 5101: Bioinstrumentation (TA)

ADVISING

Graduate Committee Member

Chandler Griffith, 2025
- Degree: MSEE
- Thesis: Optical frequency domain reflectometry

Jason Sommer, 2025
- Degree: MSEE
- Project: Kinetic sand table

Ying Liang, 2021
- Degree: MSCE
- Project: Applying knowledge graph and natural language processing to question answer system

Taylor Hansen, 2020
- Degree: MSEE
- Project: Open-source antenna pattern measurement system using coherent DSB-SC amplitude modulation

ACADEMIC SERVICE	Weber State University Research, Scholarship, and Professional Growth Committee, 2024-Present
	Weber State University ECE Program Coordinator, 2021-Present
	Weber State University Faculty Senate Member, 2020-Present
	Weber State University Tau Beta Pi Faculty Advisor, 2023-Present
	Weber State University Faculty Senate Executive Committee, 2020-2022
	Weber State University ECE Department Faculty Search Committee, 2019, 2021, 2022, 2023, 2024
	Trainee Member, UCAIR Operations Council, 2019
	Organizer, University of Utah Radiology Machine Learning Working Group, 2017-2019
	Reviewer, IEEE Transactions on Biomedical Engineering
	Reviewer, International Society of Magnetic Resonance in Medicine
	Reviewer, Magnetic Resonance in Medicine
	Reviewer, Medical Physics
	Reviewer, New England Journal of Medicine
PROFESSIONAL MEMBERSHIPS	International Society for Magnetic Resonance in Medicine
	IEEE
	Tau Beta Pi Engineering Honor Society
TECHNICAL SKILLS	Proficient in MRI pulse programming within the General Electric EPIC environment, Matlab, Python, C/C++, PyTorch, TensorFlow/Keras, MultiSim, LTSpice
LANGUAGES	English, native language
	Mandarin Chinese, conversational spoken and basic reading/writing skills