Suma Anand

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Summary

Recent PhD in Electrical Engineering and Computer Sciences from UC Berkeley, with a focus on computational biomedical imaging. Skilled in signal processing, generative AI, machine learning, and time-series data analysis. Experienced in developing end-to-end data processing pipelines, solving inverse problems, and using AWS and Docker for distributed data analysis.

Professional Experience

08/2018 – 12/2024
Berkeley, CA, USA

Graduate Researcher
University of California, Berkeley

- Developed Beat Pilot Tone (BPT), a sensor to detect movements during MRI scans, using signal processing to extract motion and computer vision methods to reconstruct images and correct motion artifacts. Published in *Magnetic Resonance in Medicine* and presented at ISMRM 2021-2023 conferences. Received two awards for best oral presentation and *MRM Editor's Pick*.
- Worked with GE Healthcare to commercialize patented BPT technology.
- Implemented probabilistic machine learning algorithms to integrate time-series sensor data with 3D MRI images.
- Curated and analyzed motion-corrupted datasets to assess performance of motion correction algorithms.

07/2024 – 10/2024
South San Francisco, CA, USA

Intern
Insitro, Inc.

- Developed a generative AI (GAN-based) method with pytorch for imputing iron and fat biomarkers from Dixon MRI images. Accepted to the IEEE ISBI 2025 conference.
- Applied segmentation, registration, and image analysis techniques for preprocessing.
- Used high-performance computing tools (Docker, AWS) for distributed deep learning.
- Conducted literature review, investigated data sources, and formulated research strategies for medical imaging-based metabolic phenotype identification.

05/2022 – 08/2022
Oakland, CA, USA

Intern
Promaxo, Inc.

- Developed and deployed calibration and image processing software now running on a low-field MRI system, while supervising an undergraduate intern.

Education

08/2018 – 12/2024
Berkeley, CA, USA

PhD in Electrical Engineering and Computer Sciences
University of California, Berkeley

09/2013 – 08/2018
Cambridge, MA, USA

B.S. and M.Eng in Electrical Engineering
Massachusetts Institute of Technology

Skills

Programming Languages
Python, MATLAB, Bash, C

High-Performance Computing
Docker, AWS

Computer Vision
Image segmentation, image registration

ML Tools
numpy, scipy, pytorch, OpenCV, pandas, scikit-learn, matplotlib, Github, Linux

Languages
Tamil (conversational), Spanish (conversational)

Generative Models
GANs, Transformers, Diffusion Models

Awards

05/2023 **Best Software Demonstration**
ISMRM Reproducible Research Study Group
Received at the ISMRM 2023 conference.

2021 **Best Oral Presentation**
ISMRM MR Engineering and Motion Correction Study Groups
Received at the ISMRM 2021 conference.

09/2019 **NSF Graduate Research Fellowship (GRFP)**

2018 **Chancellor's Fellowship for Graduate Study**
University of California, Berkeley

Patents

2021 **Sensing Motion in MRI Using RF Intermodulation**
Senses motion during an MRI scan using minimal hardware.

Selected Publications

Beat Pilot Tone (BPT): Simultaneous MRI and RF motion sensing at arbitrary frequencies
S Anand and M Lustig. *Magnetic Resonance in Medicine*, 2024. doi: 10.1002/mrm.30150.

Synthesizing Proton-Density Fat Fraction and R2* from 2-point Dixon MRI with Generative Machine Learning
S Anand, K Xu, C O'Dushlaine, and S Mukherjee. Accepted to the *IEEE International Symposium on Biomedical Imaging (ISBI) 2025*.

Retrospective three-dimensional head motion correction with multi-input multi-output Beat Pilot Tone
S Anand, N.R.F Huttinga, Cornelis A.T. van den Berg, A Sbrizzi, and M Lustig. *ISMRM Workshop on Motion Correction in MR, 2024*.

Three-dimensional rigid head motion correction using the Beat Pilot Tone and Gaussian Processes
N.R.F Huttinga, **S Anand**, Cornelis A.T. van den Berg, A Sbrizzi, and M Lustig. *Proc. ISMRM 2023.*

Computational MRI with physics-based constraints: Application to multicontrast and quantitative imaging
J.I Tamir, F Ong, **S Anand**, E Karasan, K Wang, and M Lustig. *IEEE Signal Processing Magazine*, 37(1):94–104, 2020

Towards contact-free motion sensing technique in low-field MRI using Beat Pilot Tone
S Chen, H Sun, **S Anand**, M Lustig, Yueqi Qiu, Sijie Zhong, Hao Chen, and Zhiyong Zhang. *IEEE Transactions on Instrumentation and Measurement*, 2025.