Blake E. Zimmerman

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My career has thrived on creative problem solving within engaging, multi-disciplinary team environments. I am passionate about using applied mathematics to improve model explainablity as well as engaging with meaningful, complex, user-driven problems. With 7 years of experience, I am seeking employment where machine learning drives impactful healthcare solutions.

Relevant Employment and Education

QBio (Remote) Palo Alto, CA, USA
Senior Machine Learning Engineer *June 2022 – Present*
- Delivered a HIPAA-compliant, infrastructure-as-code platform for cloud orchestration of the primary segmentation product.
- Facilitated ML lifecycle of multiple segmentation models with special attention to model efficiency.
- Produced a highlight video to communicate company strategic objectives and capabilities (QBio LinkedIn post).

Machine Learning Engineer *April 2021 – June 2022*
- Developed kidney and spleen segmentation models and transitioned them to a micro-service product using PyTorch.
- Led design and implementation of generalized, reusable environment configurations for faster ML science iterations.
- Leveraged data augmentation inspired by understanding the MR image collection to increase ML performance.

Utah Center for Advanced Imaging Research (UCAIR) University of Utah, Salt Lake City, UT
Postdoctoral Researcher *January 2021 – April 2021*
- Applying machine learning techniques to MR imaging for transcranial focused ultrasound.
- Designing and implementing novel histology workflow for quantitative MR imaging applications.
- Developing standard operating procedures for transferring histology registration procedures.

Scientific Computing and Imaging (SCI) Institute University of Utah, Salt Lake City, UT
Graduate Research Assistant to Sarang C. Joshi and Allison H. Payne *January 2016 – January 2021*
- Utilized deep learning for segmentation to automate registration workflows.
- Worked directly with MR scanners and assisted with imaging experiments.
- Accelerated computational projects with GPU clusters and distributed Linux computing.
- Teaching assistant for biomedical engineering courses: Computational Methods; Biosystems Analysis.
- Animated and produced video summary for effective communication of image registration projects.

Bard Access Systems Salt Lake City, UT
Imaging R&D Intern and Field Assurance Engineer Intern *May 2014 – January 2016*
- Communicated and implemented standard operating procedures and reports according to FDA standards.
- Coordinated with component suppliers and manufacturing teams to ensure product success.

Skills

Languages & Libraries: Python, PyTorch, AWS Cloud Development Kit, Git, Bash, Monai, PyTorch Lightning, LaTeX, MATLAB, Slurm, CMake, Tensorflow, C/C++

Cloud Tooling: Apache Airflow, Docker, AWS Batch, AWS S3, AWS IAM, AWS Lambda, Nvidia GPUs

Education

Ph.D. Biomedical Engineering – Medical Imaging Track December 2020
University of Utah *Salt Lake City, UT*

B.S. Biomedical Engineering, GPA: 3.8 May 2016
University of Utah *Salt Lake City, UT*

Selected Courses:
- Mathematics of Imaging
- Image Processing
- Computational Methods
- Ultrasound
- Advanced Magnetic Resonance Imaging
- Introduction to Bioimaging
- Introduction to Optimization
- Classical Control Systems
- Medical Imaging Systems
- Introduction to Topology
- Programming for Engineers
- Proposal Writing & Presentation

Open Source Projects

- **CAMP** https://github.com/blakezim/CAMP
  ***C**omputational **A**natomy and **M**edical Imaging using **P**yTorch*
  - Wrote documentation for knowledge transfer to users and developers: https://sci-camp.readthedocs.io/en/latest/
  - Contributed GPU-accelerated implementations of medical image registration algorithms.
  - Wrote core techniques, including data i/o, as building blocks for other research projects.
  - Implemented 3D deformable surface registration for triangular mesh objects.

Publications:

Google Scholar, arXiv

1. **Zimmerman, B. E.**, Johnson, S. L., Odéen, H. A., Shea, J. E., Winkler, N. S., Factor, R. E., Joshi, S. C., & Payne, A. H. (2021). Towards Acute, Non-contrast Assessment of Magnetic Resonance Guided Focused Ultrasound Thermal Therapies. *In Preparation*.
2. **Zimmerman, B. E.**, Johnson, S. L., Odéen, H. A., Shea, J. E., Factor, R. E., Joshi, S. C., & Payne, A. H. (2021). Histology to 3D In Vivo MR Registration for Volumetric Evaluation of MRgFUS Treatment Assessment Biomarkers. *Manuscript submitted for publication*.
3. **Zimmerman, B. E.**, Johnson, S., Odéen, H., Shea, J., Foote, M. D., Winkler, N., Sarang Joshi, & Payne, A. (2020). Learning Multiparametric Biomarkers for Assessing MR-Guided Focused Ultrasound Treatments. IEEE Transactions on Biomedical Engineering.
4. Johnson, S. L., **Zimmerman, B. E.**, Shea, J. E., Odéen, H. A., Winkler, N. S., ., Factor, R. E., Merrill, R., Hadley, R., Joshi, S. C., & Payne, A. H. (2020). Assessment of Acute Thermal Lesions after MRgFUS Ablation with Longitudinal Volumetric MRI Registration *Manuscript submitted for publication*.
5. Foote, M. D., **Zimmerman, B. E.**, Sawant, A., & Joshi, S. C. (2019, June). Real-time 2d-3d deformable registration with deep learning and application to lung radiotherapy targeting. In International Conference on Information Processing in Medical Imaging (pp. 265-276). Springer, Cham.