Blake E. Zimmerman

1844 S 1700 E
Salt Lake City, UT
bezimmerman.com

970-316-1639 (cell)
blakez@sci.utah.edu
blakezimmerman13@gmail.com

I am a recent graduate of the University of Utah's Biomedical Engineering Ph.D. program with 4 years of experience in machine learning, computational optimization, and image processing. I am passionate about using applied mathematics and innovative computational approaches to engage with complex analytical challenges. I am looking for full-time employment that will allow me to apply and further develop my skills in machine learning and scientific computing to determine impactful, user-driven solutions.

Skills

Languages & Libraries: Python, LaTeX, MATLAB, PyTorch, Tensorflow, Git, Bash, Slurm, CMake, C/C++

Operating Systems: Linux (Ubuntu, openSUSE, CentOS), Windows, macOS

Professional: Effective engagement through verbal and written communication; Interdisciplinary team collaboration and management experience; Adaptable audience-specific presentation abilities; Timeline and goal awareness; Attentive listening and incorporation of feedback.

Education

Ph.D. Biomedical Engineering 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
- Introduction to Bioimaging
- Ultrasound
- Programming for Engineers
- Computational Methods
- Introduction to Optimization
- Classical Control Systems
- Introduction to Topology
- Medical Imaging Systems
- Advanced Magnetic Resonance Imaging
- Proposal Writing & Presentation

Open Source Projects

- **CAMP** https://github.com/blakezim/CAMP
  Computational Anatomy and Medical imaging using PyTorch
  - Read the Docs: 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.
  - Documented functions and examples, including coordinate system conventions for medical images.
  - Developed 3D deformable surface registration for triangular mesh objects.
  - Implemented volume-preserving deformable registration to reflect physiological tissue deformations.

Relevant Experience

- **Utah Center for Advanced Imaging Research (UCAIR)** University of Utah, Salt Lake City, UT
  Postdoctoral Researcher *December 2020 – Present*
  - Currently applying machine learning techniques to clinically targeted biomedical applications.
  - Designing and implementing novel histology workflow for quantitative 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 – December 2020*
  - Designed and implemented diffeomorphic image registration algorithms for multi-modality images.
  - Animated and produced video summary for effective communication of image registration projects.
  - Accelerated computational projects with GPU clusters and distributed Linux computing.
  - Extensive collaboration with multidisciplinary focused ultrasound group at UCAIR
  - Initiated and coordinated deep learning meetings for students and faculty.
  - Teaching assistant (TA) for biomedical engineering courses: Computational Methods and Biosystems Analysis.

- **Bard Access Systems**   Salt Lake City, UT
  Imaging Research and Development Intern   January 2015 – January 2016
  Field Assurance Engineer Intern   May 2014 – December 2014
  - Designed and led component qualification operations for product development.
  - Communicated and implemented standard operating procedures and reports according to FDA standards.
  - Coordinated with component suppliers and manufacturing teams to ensure product success.
  - Traveled to install product design changes at remote manufacturing facilities.
  - Wrote professional reports to communicate identified failure mode analysis on implanted medical devices.

- **Orthopedic Research Lab**   Salt Lake City, UT
  Undergraduate Research Assistant   May 2013 – May 2014
  - Segmented and built 3D models of human hips from CT images and performed real-life motion experiments.
  - Generated mesh structures of hip joint cartilage for finite element analysis during motion animations.
  - Communicated scientific results with poster and oral presentations in professional conference settings.

Selected Contributions: 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.

Interests

Sports: Skiing, mountain biking, rock climbing, ice climbing, mountaineering, trail running, river rafting, and more.

References

Sarang C. Joshi   sjoshi@sci.utah.edu
Professor, Biomedical Engineering   +1 (801) 587-7961
  - Warnock Engineering Building, 72 S Central Campus Drive, University of Utah, Salt Lake City, UT 84112

Allison H. Payne   Allison.Payne@hsc.utah.edu
Professor, Radiology and Imaging Sciences   +1 (801) 585-1448
  - Imaging and Neurosciences Center, 729 Arapeen Way, University of Utah, Salt Lake City, UT 84108

Dennis L. Parker   dennis.parker@hsc.utah.edu
Professor, Biomedical Infromatics and Radiology and Imaging Sciences   +1 (801) 581-8654
  - Imaging and Neurosciences Center, 729 Arapeen Way, University of Utah, Salt Lake City, UT 84108