

AMIR GHOLAMI

amirgh@eecs.berkeley.edu ◊ www.amirgholami.org ◊ github id: amirgholami

EDUCATION

- **University of California, Berkeley** *July 2017- Present*
PostDoc in Berkeley AI Research (BAIR), EECS Department
- **The University of Texas at Austin** *June 2017*
PhD, Computational Science and Engineering Mathematics,
GPA 4.00/4.00 (Adviser: Prof. G. Biros)
- **Master of Science in Mechanical Engineering,** *June 2014*
GPA 4.00/4.00
- **Tehran Polytechnic (Amirkabir University)** *June 2011*
Bachelor of Science in Aerospace Engineering,
GPA 3.89/4.00 (Top student out of 55)

EXPERIENCE

- Simons Institute** Fall 2018
Research Fellow in Foundations of Data Science Program *Berkeley, CA*
- NVIDIA** Summer 2016
CUDA Library/Deep Learning Software Engineer Intern *Santa Clara, CA*
- Advanced Micro Devices (AMD)** Summer 2015
Software Engineer Intern at AMD Compute Library Team *Austin, TX*
- Institute for Computational Engineering and Sciences** 2011-Present
Graduate Research Assistant *Austin, TX*

HONORS AND AWARDS

- Recipient of UT Austin's **2018 Outstanding Dissertation Award** along with Best Dissertation Award from ICES *2018*
- Recipient of UC Berkeley/NSF **FODA/BIDS** PostDoctoral Fellowship *2018-2020*
- **Finalist for Robert J. Melosh Medal** *2018*
- **Best Student Paper**, ACM/IEEE Supercomputing conference (SC'17) *2017*
- **Gold medal** in ACM Student Research Competition at SC'15 *2015*
- **Best Student Paper finalist**, ACM/IEEE Supercomputing conference (SC'14) *2014*
- **Second place** in 2014 TACC-BP America parallel programming contest *2014*
- **Student Employee Excellence**, UT Austin *2014*
- Graduate school's Professional Development Award, UT Austin *2013*
- **Best B.Sc. thesis of the year** in Aerospace Engineering, Tehran Polytechnic *2011*
- Graduated as top student (out of 55) in my undergraduate studies *2011*

PUBLICATIONS

Journal/Proceedings

- Z. Yao, A. Gholami, Q. Lei, K. Keutzer, and M. Mahoney. Hessian-based analysis of large batch training and robustness to adversaries. *NIPS'18*, 2018. [\[PDF\]](#)
- Zhewei Yao, Amir Gholami, Peng Xu, Michael Mahoney, and Kurt Keutzer. Trust region based adversarial attack on neural networks. *Under review*, 2018
- A. Gholami, A. Azad, P. Jin, K. Keutzer, and A. Buluc. Integrated model, batch and domain parallelism in training neural networks. *ACM Symposium on Parallelism in Algorithms and Architectures (SPAA'18)*, 2018. [\[PDF\]](#)
- Amir Gholami, Shashank Subramanian, Varun Shenoy, Naveen Himthani, Xiangyu Yue, Sicheng Zhao, Peter Jin, George Biros, and Kurt Keutzer. A novel domain adaptation framework for medical image segmentation. *Lecture Notes in Computer Science (LNCS)*, 2018
- Zhewei Yao, Amir Gholami, Kurt Keutzer, and Michael Mahoney. Large batch size training of neural networks with adversarial training and second-order information. *arXiv:1810.01021*, 2018. [\[PDF\]](#)
- Noah Golmant, Nikita Vemuri, Zhewei Yao, Vladimir Feinberg, Amir Gholami, Kai Rothauge, Michael Mahoney, and Joseph Gonzalez. On the computational inefficiency of large batch sizes for stochastic gradient descent. *Under review*, 2018. [\[PDF\]](#)
- Norman Mu, Zhewei Yao, Amir Gholami, Michael Mahoney, and Kurt Keutzer. Weight re-initialization through cyclical batch scheduling. *Systems for ML Workshop at NIPS 18*, 2018
- K. Kwon, A. Amid, A. Gholami, B. Wu, K. Asanovic, and K. Keutzer. Co-design of deep neural nets and neural net accelerators for embedded vision applications. *Design Automation Conference (DAC'18)*, 2018. [\[PDF\]](#)
- Shashank Subramanian, Amir Gholami, and George Biros. Simulation of glioblastoma growth using a 3D multispecies tumor model with mass effect. *arXiv:1810.05370*, 2018. [\[PDF\]](#)
- B. Wu, A. Wan, X. Yue, P. Jin, S. Zhao, N. Golmant, A. Gholami, J. Gonzalez, and K. Keutzer. Shift: A zero flop, zero parameter alternative to spatial convolutions. *Computer Vision and Pattern Recognition (CVPR'18)*, 2018. [\[PDF\]](#)
- K. Scheufele, A. Mang, A. Gholami, C. Davatzikos, G. Biros, and M. Mehl. Coupling brain-tumor biophysical models and diffeomorphic image registration. *arXiv:1710.06420*, 2017. [\[PDF\]](#)
- A. Mang, S. Tharakan A. Gholami, N. Himthani, S. Subramanian, J. Levitt, M. Azmat, K. Scheufele, M. Mehl, C. Davatzikos, B. Barth, and G. Biros. SIBIA-GIS: Scalable biophysics-based image analysis for glioma segmentation. *The multimodal brain tumor image segmentation benchmark (BRATS), MICCAI*, 2017. [\[PDF\]](#)
- A. Gholami, A. Mang, K. Scheufele, C. Davatzikos, M. Mehl, and G. Biros. A framework for scalable biophysics-based image analysis. *Proceedings of ACM/IEEE SuperComputing Conference (SC'17)*, 2017 (**Best Student Paper**). [\[PDF\]](#)
- Andreas Mang, Amir Gholami, Christos Davatzikos, and George Biros. Pde-constrained optimization in medical image analysis. *Optimization and Engineering*, pages 1–48, 2017
- A. Mang, A. Gholami, and G. Biros. Distributed-memory large-deformation diffeomorphic 3D image registration. *Proceedings of ACM/IEEE SuperComputing Conference (SC16)*, 2016. [\[PDF\]](#)
- D. Malhotra, A. Gholami, and G. Biros. A volume integral equation stokes solver for problems with variable coefficients. *Proceedings of ACM/IEEE SuperComputing Conference (SC14)*, 2014 (**Best Student Paper Finalist**). [\[PDF\]](#)
- A. Gholami, D. Malhotra, H. Sundar, and G. Biros. FFT, FMM, or MultiGrid? a comparative study of state-of-the-art Poisson solvers for uniform and nonuniform grids in the unit cube. *SIAM Journal on Scientific Computing*, 38(3):C280–C306, 2016. [\[PDF\]](#)
- A. Gholami, A. Mang, and G. Biros. An inverse problem formulation for parameter estimation of a reaction-diffusion model of low grade gliomas. *Journal of mathematical biology*, 72:409–433, 2015. [\[PDF\]](#)

- A. Gholami, J. Hill, D. Malhotra, and G. Biros. AccFFT: A library for distributed-memory FFT on CPU and GPU architectures. *arXiv:1506.07933*, 2015

Patents

- B. Ginsburg, S. Nikolaev, A. Kiswani, H. Wu, A. Gholami, S. Kierat, M. Houston, and A. Fit-Flores. Tensor processing using low precision format. *US Patent 15/624577*, 2017.
- A. Gholami and B. Natarajan. A novel high performance inplace transpose algorithm. *US Patent (15/219672)*, 2015.
- A. Fit-Florea, A. Gholami, B. Ginsburg, and P. Davoodi. Dynamic directional rounding. *Nvidia Patent Office (approved, US patent pending)*, 2018.
- A. Gholami, R. Hosseini, M. Nabil, and M. H. Samadinia. Pool boiling cooling system. *Iran Industrial Property Office*, 68033, 2010.