

# AMIR GHOLAMI

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## EDUCATION

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- **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

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- 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*
- Thermodynamics Lab, Tehran Polytechnic** 2007-2011  
*Undergraduate Research Assistant* *Tehran, IR*

## HONORS AND AWARDS

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- **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*
- **First place** in Broader Engagement programming challenge at 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*
- Selected as *Outstanding Student*, Tehran Polytechnic *2010*
- Member of *Honorary Student* society, Tehran Polytechnic *2010*

## PUBLICATIONS

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### Journal/Proceedings

- Z. Yao, A. Gholami, Q. Lei, K. Keutzer, and M. Mahoney. Hessian-based analysis of large batch training and robustness to adversaries. *Preprint: arXiv:1802.08241*, 2018. [PDF]
- A. Gholami, A. Azad, P. Jin, K. Keutzer, and A. Buluc. Integrated model, batch and domain parallelism in training neural networks. *arXiv:1712.04432*, 2017. [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. *arXiv:1711.08141*, 2017. [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]
- A. Mang, A. Gholami, C. Davatzikos, and G. Biros. PDE constrained optimization in medical image analysis. *Optimization and Engineering*, 2017 (in review)
- 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]
- Amir Gholami, Dhairya Malhotra, Hari Sundar, and George 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
- 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 preprint arXiv:1506.07933*, 2015
- R. Hosseini, A. Gholami, and M. Nabil. Concerning the effect of surface material on nucleate boiling heat transfer of R-113. *Journal of Electronics Cooling and Thermal Control*, 1(2):22–27, 2011.

### Workshops

- A. Gholami, A. Azad, K. Keutzer, and A. Buluc. Communication analysis of integrated model and data parallelism in training neural networks. *Deep Learning at Supercomputer Scale, NIPS, 2017*

### Talks

- A. Gholami, Bichen Wu, and Kurt Keutzer. Deep learning in autonomous vehicles. *Intel Autonomous Driving Workshop, Santa Clara, CA, 2017*.
- A. Gholami. Fast algorithms for inverse problems with parabolic pde constraints with application to biophysics-based image analysis. *Stanford, ICME Star Talk Series, 2017*.
- A. Mang, A. Gholami, and G. Biros. Parallel algorithms for PDE-constrained optimization problems with hyperbolic constraints. *Minisymposium at SIAM CSE, Atlanta, GA, USA, 2017*.
- A. Gholami and G. Biros. On preconditioning Newton method for PDE constrained optimization problems. *Minisymposium at SIAM Conference on Imaging Sciences, Albuquerque, NM, USA, 2016*.

- A. Gholami and G. Biros. Challenges for exascale scalability of elliptic solvers using a model Poisson solver and comparing state-of-the art methods. *13th U.S. National Congress on Computational Mechanics, San Diego*, 2015.
- A. Gholami and G. Biros. Parameter estimation for malignant brain tumors. *Minisymposium at SIAM CSE, Salt Lake, Utah, USA*, 2015.
- A. Gholami and G. Biros. A massively parallel solver for reaction diffusion inverse problems. *UT DiaMonD meeting, Austin, TX, USA*, 2014.
- A. Gholami and G. Biros. A numerical algorithm for biophysically-constrained parameter estimation for tumor modeling and medical images analysis. *12th U.S. National Congress on Computational Mechanics, Raleigh, NC, USA*, 2013.
- A. Gholami and G. Biros. Image-driven inverse problem for estimating initial distribution of brain tumor modeled by advection-diffusion-reaction equation. *SIAM Annual Meeting, San Diego, CA, USA*, 2013.

### Posters

- A. Gholami and G. Biros. AccFFT: A New Parallel FFT Library for CPU and GPU Architectures. *ACM/IEEE Supercomputing (SC15), Austin, TX (Gold medal at ACM Student Research Competition)*, 2015.
- A. Gholami and G. Biros. Inverse problem method for parameter estimation of a reaction-diffusion model of low grade gliomas. *13th U.S. National Congress on Computational Mechanics, San Diego,, 2015*.
- A. Gholami and G. Biros. A numerical algorithm for biophysically-constrained parameter estimation for tumor modeling and data assimilation with medical images. *Poster at 12th U.S. National Congress on Computational Mechanics, Raleigh, NC, USA*, 2013.
- A. Gholami and G. Biros. Fast algorithms for inverse problems of reaction-diffusion-advection equations. *SIAM Annual Meeting, Minneapolis, MN, USA*, 2012.
- A. Gholami and G. Biros. Image-driven inverse algorithms for brain tumor modeling and diagnosis. *ASME Congress and Exposition (IMECE2012), Houston, TX, USA*, 2012.

### 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 Pending (15/219672)*, 2015.
- A. Fit-Florea, A. Gholami, B. Ginsburg, and P. Davoodi. Dynamic directional rounding. *Submitted to Nvidia Patent Office*, 2016.
- A. Gholami, R. Hosseini, M. Nabil, and M. H. Samadinia. Pool boiling cooling system. *Iran Industrial Property Office*, 68033, 2010.