

# Leila Ghaffari

Curriculum Vitae

March 2023

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Google Scholar : <https://scholar.google.com/citations?user=gW-Ve9sAAAAJ>

## EDUCATION

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- **University of Colorado Boulder** Boulder, CO  
*PhD in Computer Science* *Aug. 2019 – Present*
- **Sharif University of Technology** Tehran, Iran  
*M.Sc in Chemical Engineering* *Sep. 2013 – Jan. 2016*
- **University of Tehran** Tehran, Iran  
*B.Sc in Chemical Engineering* *Sep. 2006 – Jan. 2011*

## EXPERIENCE

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- **University of Colorado Boulder** Boulder, CO  
*Graduate Research Assistant* *Apr. 2020 - Present*
  - Contributing to fluids with [libCEED](#) and [PETSc](#).
  - Contributing to structures with [Ratel](#) and [Enzyme-AD](#), a high-performance automatic differentiation tool, for developing new material models.
  - Investigating generalizations of blocked Krylov methods for Kronecker-type systems.
- **The National Center for Atmospheric Research (NCAR)** Boulder, CO  
*SIParCS Intern* *May 2021 - Jul. 2021*

Ported the Shallow Water Model mini-app with DPC++, ran it on an Intel Xeon Skylake CPU and an Intel-Xe GPU with different problem sizes, and studied the performance of the ported code ([Performance Portability of Shallow Water Model with DPC++](#)).

## PUBLICATIONS

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- Jed Brown, Valeria Barra, Natalie Beams, **Leila Ghaffari**, Matthew Knepley, William Moses, Rezgar Shakeri, Karen Stengel, Jeremy L. Thompson, and Junchao Zhang. 2022. Performance Portable Solid Mechanics via Matrix-Free p-Multigrid. [doi:10.48550/arXiv.2204.01722](https://doi.org/10.48550/arXiv.2204.01722)
- Jed Brown, Ahmad Abdelfattah, Valeria Barra, Natalie Beams, Jean-Sylvain Camier, Veselin Dobrev, Yohann Dudouit, **Leila Ghaffari**, Tzanio Kolev, David Medina, Will Pazner, Thilina Rathnayake, Jeremy Thompson, Stan Tomov, *libCEED: Fast algebra for high-order element-based discretizations*, Journal of Open Source Software, 6(63), 2945, [doi:10.21105/joss.02945](https://doi.org/10.21105/joss.02945)

## TECHNICAL REPORTS

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- Kolev, Tzanio, Fischer, Paul, Abdelfattah, Ahmad, Beams, Natalie, Brown, Jed, Camier, Jean-Sylvain, Carson, Robert, Chalmers, Noel, Dobrev, Veselin, Dudouit, Yohann, **Ghaffari, Leila**, Joshi, Aditya Y., Kerkemeier, Stefan, Lan, Yu-Hsiang, McDougall, Damon, Medina, David, Min, Misun, Mishra, Abhishek, Pazner, Will, Warburton, Tim. (2022). *CEED ECP Milestone Report: High-order algorithmic developments and optimizations for more robust exascale applications*. Zenodo. [doi:10.5281/zenodo.6514857](https://doi.org/10.5281/zenodo.6514857)
- Kolev, Tzanio, Fischer, Paul, Austin, Anthony P., Barker, Andrew T., Beams, Natalie, Brown, Jed, Camier, Jean-Sylvain, Chalmers, Noel, Dobrev, Veselin, Dudouit, Yohann, **Ghaffari, Leila**, Kerkemeier, Stefan, Lan, Yu-Hsiang, Merzari, Elia, Min, Misun, Pazner, Will, Ratnayaka, Thilina, Shephard, Mark S., Siboni, Morteza

H., Warburton, Tim. (2021). *CEED ECP Milestone Report: High-order algorithmic developments and optimizations for large-scale GPU-accelerated simulations*. Zenodo. [doi:10.5281/zenodo.4672664](https://doi.org/10.5281/zenodo.4672664)

- Abdelfattah A., Barra V., Beams N., Brown J., Camier J. S., Dobrev V., Dudouit Y., **Ghaffari L.**, Kolev T., Medina D., Rathnayake T., Thompson J. L., Tomov S., *libCEED User Manual*, Version 0.7, Zenodo, September 2020. [doi:10.5281/zenodo.4302737](https://doi.org/10.5281/zenodo.4302737)

## TALKS

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- **SIAM Conference on Computational Science and Engineering** Amsterdam, The Netherlands  
*SIAM-CSE23* Feb. 2023  
*Forward-Mode Enzyme in Developing Constitutive Models with Ratel*  
**Leila Ghaffari**, William Moses, Jeremy L Thompson, Karen Stengel, Rezgar Shakeri, and Jed Brown
- **Enzyme Conference 2023** Boulder, CO  
*EnzymeCon 2023* Feb. 2023  
*Automatic Differentiation in Solid Mechanics: Interpretation and Composition*  
**Leila Ghaffari**, William Moses, Jeremy L Thompson, Karen Stengel, Rezgar Shakeri, and Jed Brown
- **World and Asian Pacific Congresses on Computational Mechanics** Online  
*WCCM-APCOM 2022* Jul. 2022  
*On Performance portability of physical problems using libCEED*  
**Leila Ghaffari**, Valeria Barra, Jeremy Thompson, James Wright, and Jed Brown
- **SIAM Conference on Parallel Processing for Scientific Computing** Online  
*SIAM-PP22* Feb. 2022  
*On Portability and Performance Versatility in Nonlinear Solid and Fluid Mechanics Using libCEED and PETSc*  
**Leila Ghaffari**, Jeremy Thompson, Valeria Barra, Rezgar Shakeri, Karen Stengel, and Jed Brown
- **The National Center for Atmospheric Research (NCAR)** Online  
*SIParCS 2021* Jul. 2021  
*Performance Portability of Shallow Water Model with DPC++*  
**Leila Ghanffari** and Zephaniah Connell
- **SIAM Conference on Computational Science and Engineering** Online  
*SIAM-CSE21* Mar. 2021  
*Advances in LibCEED with Applications to Fluid and Solid Mechanics*  
**Leila Ghaffari**, Jeremy Thompson, Valeria Barra, and Jed Brown

## HONORS AND AWARDS

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- **Student Travel Award (\$950)**  
*SIAM* Jan. 2023
- **Clive Baillie Memorial Fellowship (\$1200)**  
*Computer Science Department at CU Boulder* Oct. 2022
- **Clive Baillie Memorial Fellowship (\$1000)**  
*Computer Science Department at CU Boulder* Oct. 2020

MENTORING EXPERIENCE

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- **Summer Program for Undergraduate Research (SPUR)** Boulder, CO  
*University of Colorado Boulder* *May 2022 - present*  
Kellen Davis Martin (B. Sc. in Aerospace Engineering, University of Colorado Boulder)
- **Summer Program for Undergraduate Research (SPUR)** Boulder, CO  
*University of Colorado Boulder* *Jun. 2021 - Aug. 2021*  
David Reeder (B. Sc. in Mechanical Engineering, University of Colorado Boulder)