Harsha Lokavarapu

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https://github.com/hlokavarapu

Professional Preparation

University of California, Davis	MS	Computational Geodynamics (4.0 GPA)	2017–
		Thesis Adviser Louise H. Kellogg	
University of California, Davis	BS	Computer Science	2015
	Minor	Applied Mathematics	2015

Appointments

2014-2017	Computational Infrastructure for Geodynamics (CIG)	Junior Assistant Programmer
2012	Certify Data Systems (Humana)	Internship as Code Developer

Programming Languages, Computing Skills, and Experience

Open Source Code Development

- Advanced Solver for Problems in Earth's ConvecTion (ASPECT) - C++ There is more. Parameter parsing?
- State of-the-art model of the Earth's Geodynamo Calypso - Fortran Where is the GPU?
- Generalized Reservoir Modeling (MS Thesis Project) - Python This is a Carbon Reservoir in the Earth's Deep Interior, and perhaps elswhere is it not?

Parallel Processing / High Performance Computing (HPC) Experience

Tools

- SLURM - HPC scheduler
- Distributed memory parallelism - MPI for C++ and FORTRAN
- Shared memory parallelism - openMP
- CUDA - C++
- Profilers: gdb and cuda-gdb

Machines

National Science Foundation (NSF) Texas Advanced Computing Center

Stampede and Stampede 2
Maverick

UCD Math and Physical Sciences (MPS) HPC Cluster

- Ymir Details, briefly ...
- Peloton Details, briefly ...

Computations

- ASPECT
  - Executed strong and weak scaling tests for original draft of publication [1] (see below), which was not included in the final publication
- Calypso
  - Wrote GPU code to speed up Legendre Polynomial computations in spherical geometry
  - Published as poster at 2014 Annual Fall AGU Meeting

Data Analysis and Visualization

- R, python tools,
- python tools
- gnuplot
- paraview
- Anything else?

Continuous Integration Tools

- Jenkins - Java
- Travis

Outside Interests

- Virtual Reality - (A-frame) - JavaScript
- 3-D Design/Printing - (Tinkercad)
- Neural Networks - (Kereas, Tensorflow) - Python

Professional Affiliations and Activities

2017–	Member	Deep Carbon Observatory
2014-2016	Member	American Geophysical Union
2016 dates!!!	Participant	ASPECT Hackathon
2016	Participant	CIG - All Hands Meeting
2015	Participant	ASPECT Hackathon

PUBLICATIONS

REFEREED JOURNAL PUBLICATIONS

Submitted

L. H. Kellogg, D. L. Turcotte, M. Weisfeiler, H. Lokavarapu[@], S. Mukhopadhyay, (2018) "Implications of a Reservoir Model for the Evolution of Deep Carbon", *Earth and Planetary Science Letters*, Ms. Ref. No.: EPSL-D-17-01055

Accepted

R. Gassmoeller, H. Lokavarapu[@], E. Heien, E. G. Puckett, and W. Bangerth, (2018) "Flexible and scalable particle-in-cell methods with adaptive mesh refinement for geodynamic computations", *Geochemistry, Geophysics, Geosystems* manuscript 2018GC007508R View Accepted Manuscript

Appeared

E. G. Puckett, D. L. Turcotte, L. H. Kellogg, Y. He[†], J. M. Robey[*], and H. Lokavarapu[@] (2018) "New numerical approaches for modeling thermochemical convection in a compositionally stratified fluid", Special issue of . *Physics of the Earth and Planetary Interiors* associated with the 15th Studies of the Earth's Deep Interior (SEDI) Symposium (*Phys. Earth. Planet. In.*) **276**:10–35, 10.1016/j.pepi.2017.10.004 View Article

POSTER PRESENTATIONS

L. H. Kellogg, H. Lokavarapu[@], D. L. Turcotte, and S. Mukhopadhyay (2017) "A reservoir model study of the flux of carbon from the atmosphere, to the continental crust, to the mantle", *Annual Geophysical Union Fall Meeting 2017* View Abstract

J. Jiang, A. P. Kaloti, H. R. Levinson, N. Nguyen, E. G. Puckett, and H. Lokavarapu[@] (2016) "Benchmark Results Of Active Tracer Particles In The Open Souce Code ASPECT For Modelling Convection In The Earth's Mantle", *Annual Geophysical Union Fall Meeting 2016* View Abstract

E. G. Puckett, D. L. Turcotte, L. H. Kellogg, H. Lokavarapu[@], Y. He[†], and J. M. Robey[*] (2016) "New Numerical Approaches To thermal Convection In A Compositionally Stratified Fluid", *Annual Geophysical Union Fall Meeting 2016* View Abstract

H. Lokavarapu[@], and H. Matsui (2015) "Optimization of Parallel Legendre Transform using Graphics Processing Unit (GPU) for a Geodynamo Code", *Annual Geophysical Union Fall Meeting 2015* View Abstract

J. A. Russo, E. H. Studley, H. Lokavarapu[@], I. Cherkashin, and E. G. Puckett (2014) "A New Monotonicity-Preserving Numerical Method for Approximating Solutions to the Rayleigh-Benard Equations", *Annual Geophysical Union Fall Meeting 2014* View Abstract

H. Lokavarapu[@], H. Matsui, and E. M. Heien (2014) "Parallelization of the Legendre Transform for a Geodynamics Code", *Annual Geophysical Union Fall Meeting 2014* View Abstract

[@]Undergraduate Student
[*]Graduate Student
[†]Postdoctoral Scholar

EDUCATION

Can you make this page two columns?

Computer Science Courses

- 10 - Concepts of Computing

- 20 - Discrete Mathematics for Computer Science

- 30 - Introduction to Programming and Problem Solving

- 40 - Software and Object-Oriented Programming

- 50 - Machine Dependent Programming

- 60 - Data Structures and Programming

- 120 - Theory of Computation

- 122A - Algorithm Design

- 140A - Programming Languages

- 150 - Operating Systems

- 152A - Computer Networks

- 153 - Computer Security

- 154A - Computer Architecture

- 158 - Parallel Architectures

- 170 - Artificial Intelligence

- 188 - Ethics in an Age of Technology

Mathematics

- 21B - Differential Calculus

- 21C - Integral Calculus

- 21D - Vector Analysis

- 22A - Linear Algebra

- 22B - Ordinary Differential Equations

- 118A - Partial Differential Equations (first quarter)

- 118B - Partial Differential Equations (second quarter)

- 125A - Real Analysis (Foundations of Calculus)

- 125B - Real Analysis (second quarter)

- 135A - Probability

- 150A - Modern Algebra (first quarter)

- 150B - Modern Algebra (second quarter)

- 167 - Advanced Linear Algebra: Machine Learning

- 228A - Computational methods for Partial Differential Equations