

Thomas Conrad Clevenger

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CITIZENSHIP: United States of America

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LANGUAGES: English (Native)

SKILLS, QUALIFICATIONS, AND EXPERTISE

Programming:

- C++ with MPI
- Python
- Matlab
- R

Computational Mathematics:

- Finite element method
- High Performance/Parallel Computing
- Algebraic & Geometric Multigrid methods
- Preconditioning
- Mesh partitioning schemes
- Numerical linear algebra
- Numerical partial differential equations
- Multivariate Functional Approximation
- Finite difference method
- Extended finite element method
- Linear regression analysis
- Linear, nonlinear, & network optimization
- Modeling and simulation

Software Packages: (* implies active contributor)

- deal.II* (C++ finite element library)
 - Contributed around 21,000 lines of code
- ASPECT* (C++ mantle convection library)
 - Contributed around 3,500 lines of code
- FEniCS Project (C++ finite element library)
- LaTeX & Beamer

Version Control:

- git

Platforms:

- Linux & Ubuntu
- OS X

EDUCATION

• *Ph.D., Mathematical Sciences, Clemson University*

Thesis title: A Parallel Geometric Multigrid Method for Adaptive Finite Elements

December 2019

QPA: 3.88/4.00

Preliminary exams passed in Numerical Analysis, Statistics, Operations Research

• *M.S., Mathematical Sciences, Clemson University*

December 2016

QPA: 3.84/4.00

Thesis title: Partitioning of Parallel Adaptive Geometric Multigrid

• *B.S., Mathematics, LaGrange College*

May 2014

Minor: Music and Servant Leadership

QPA: Overall: 3.80/4.00 Major: 4.00/4.00

HONORS, AWARDS, AND SCHOLARSHIPS

• *Teaching Assistantship, Clemson University*

Fall 2014 - present

Stipend of \$17,000 and full tuition waiver.

• *Verdie Miller Award for Outstanding Undergraduate career in Mathematics*

Spring 2014

• *LaGrange College Dean's List*

2011 - 2014

EMPLOYMENT

- *Post Doctoral Fellow, Clemson University** Jan 2020 - Current
- *Research Assistant, Clemson University** Spring 2018, Fall 2019
- *Visiting Research Assistant, University of Utah** Spring 2019
- *Teaching Assistant, Clemson University* Summer 2014 - Fall 2017, Fall 2018
 - MATH 1060 (Calculus of One Variable I), Teacher of record
 - STAT 2300 (Statistical Methods I), Lab instructor
 - MATH 8600 (Scientific Computing), Grader
 - MATH 1080 (Calculus of One Variable II), Grader

*Supported by NSF Award OAC-1835452 and by the Computational Infrastructure in Geodynamics initiative (CIG), through the NSF under Award EAR-0949446

INTERNSHIPS & RESEARCH VISITS

- *Argonne National Laboratory, Chicago, USA* May 2018 - July 2018
 - Paid Research Aide for Tom Peterka in the MCS division at Argonne National Laboratory.
 - Project aimed at developing multivariate functional approximations to large, parallel data sets.
 - Specifically focused on efficiently merging multiple piecewise spline approximations across processors.
- *Technical University of Munich, Germany* June 2017 - July 2017
 - Received department funding for research trip with colleague Dr. Martin Kronbichler
 - Tested `deal.II` implementation of Geometric Multigrid for large parallel finite element systems.
 - Added `deal.II` functionality for periodic boundary conditions on a multilevel mesh.
- *Center of Industrial Mathematics, University of Bremen, Germany* May 2015 - July 2015
 - Developed algorithms to detect problematic situations in a discontinuous finite element mesh.
 - Implemented these algorithms within an existing C++ toolbox.
 - Department funded.

CONFERENCE, SEMINAR, & WORKSHOP PRESENTATIONS

- *7th deal.II Developers Workshop* August 2019
 - Fort Collins, CO
 - “Geometric Multigrid in `deal.II`”
- *ASPECT Hackathon* May 2019
 - Heber City, UT
- *19th Copper Mountain Conference On Multigrid Methods* Workshop March 2019
 - Copper Mountain, CO
 - “Adaptive, Parallel, Matrix-free Geometric Multigrid for Stokes Equations with Large Viscosity Contrast”
- *Graduate Student Mini-conference in Computational Mathematics* Talk Feb 2018
 - University of South Carolina, Columbia, SC
 - “Partitioning Scheme for Flexible Parallel Adaptive Geometric Multigrid”
- *Fast high order DG methods for future architectures* Talk July 2017
 - University of Heidelberg, Germany
 - “Partitioning of parallel adaptive geometric multigrid”

PUBLICATIONS

- Arndt, D. et al., “The **deal.II** Library, Version 9.1”, *Journal of Numerical Mathematics*, accepted 2019
- Clevenger, T. C., Heister, T., Kanschat, G., and Kronbichler, M., “A Flexible, Parallel, Adaptive Geometric Multigrid method for FEM.”, submitted (2019)
- Clevenger, T. C., Heister, T., “Comparison Between Algebraic and Matrix-free Geometric Multigrid for a Stokes Problem on Adaptive Meshes with Variable Viscosity”, submitted (2019)
- Clevenger T. C., Master’s Thesis, Clemson University, December 2016
“Partitioning of Parallel Adaptive Geometric Multigrid”

SERVICE AND VOLUNTEER WORK

- **SIAM officer at Clemson University** *Fall 2017 - Fall 2018*
Plan talks and other department events hosted by Clemson’s SIAM chapter
Organize and raise funds for department events
- **Volunteer Child Care Director, Circles of Troup County Organization** *Oct 2012 - May 2014*
Directed child care for approx. 15 children ages 3 - 16 at the weekly meetings.
Offered high school Math and Science tutoring free of charge.
- **Our Daily Bread Soup Kitchen Co-Founder and Board Member** *Nov 2012 - May 2014*
Provided lunch for the people of LaGrange, GA on Fridays.
Provided fresh produce when available.