Jay M. Appleton

– Clarkson University, Department of Mathematics –

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Education

Aug. 2020*	**Ph.D. Applied Mathematics**, *Clarkson University, Potsdam, NY* **expected* *Doctoral Advisor:* Brian T. Helenbrook *Dissertation:* On the development and existence of continuous triangular hp/finite element methods for time-dependent applications
May 2012	**M.S. Mathematics**, *Clarkson University, Potsdam, NY* *Matrix Theory and Algebra*
May 2008	**B.S. Mathematics**, *University of Hartford, West Hartford, CT*
May 2008	**B.A. Languages & Cultures, Concentration in German**, *University of Hartford, West Hartford, CT*

Professional Appointments

2019 - 2020	**Community Organizer**, *Tom Steyer's Presidential Campaign, Long Beach, CA*
2018 - 2019	**Graduate Student Research Assistant**, *Clarkson University, Potsdam, NY*
2017 - 2018	**Visiting Faculty Instructor**, *Clarkson University, Potsdam, NY*
2016 - 2017	**Graduate Student Teaching Assistant**, *Clarkson University, Potsdam, NY*
2014 - 2016	**Visiting Faculty Instructor**, *University of Hartford, West Hartford, CT*
2014	**Graduate Student Instructor**, *Clarkson University, Potsdam, NY*
2009 - 2013	**Graduate Student Research and Teaching Assistant**, *Clarkson University, Potsdam, NY*

Research Interests and Mathematical Skills

Finite Element Methods; Finite Difference Methods; Applied Linear Algebra; Scientific Computing; Dynamical Systems; Fluid Dynamics; Applied Mathematics; Matrix Theory

Publications

A High-Order Lower-Triangular Pseudo-Mass Matrix for Explicit Time-Advancement of hp Triangular Finite Element Methods, *J. M. Appleton and B. T. Helenbrook,* SIAM Journal on Numerical Analysis, 2019, (*In Revision – Preprint:* arXiv:1906.10774).

A Local Approximate Mass Matrix Inversion for C^0 hp Triangular Finite Element Methods, *J. M. Appleton and B. T. Helenbrook,* SIAM Journal on Numerical Analysis, 2020, (*In Preparation*).

Presentations

High Order Continuous Triangular Finite Element Explicit Time Stepping via a Twisted Mass Matrix Inversion Scheme, *North American High Order Methods Conference (NAHOMCon),* San Diego, CA, June 2019.

A Lower-Triangular Mass Matrix Approach to Explicit Time Advancement for Continuous Triangular Finite Element Methods, *Joint Mathematics Meetings (JMM 2019),* Baltimore, MD, January 2019.

Explicit Time Advancement for Continuous Triangular Finite Element Methods, *The 13^{th} World Conference on Computational Mechanics (WCCMXII),* New York, NY, July 2018.

A Lower-Triangular Mass Matrix Approach to Explicit Time Advancement for Continuous Triangular Finite Element Methods, *The 11^{th} Annual Ottawa Mathematics Conference,* Ottawa, ON, CA, June 2018.

Explicit Time Advancement of Unsteady Partial Differential Equations via High Order Triangular Finite Element Methods, *Mathematics Conference and Competition of Northern New York (MCCNNY),* Potsdam, NY, October 2017.

(Invited) Explicit Time Advancement of Unsteady Partial Differential Equations via High Order Triangular Finite Element Methods, *Clarkson Center for Complex Systems Science (C^3S^2),* Potsdam, NY, September 2017.

A Novel, High-Order Continuous Triangular FEM That Allows for Low-Cost and Accurate Explicit Time Advancement, *Research and Project Showcase at Clarkson University (RAPS),* Potsdam,NY, April 2017.

(Poster) On the Development of Explicit Continuous Finite Element Methods on Triangles, *Research and Project Showcase at Clarkson University (RAPS),* Potsdam, NY, April 2017.

(Poster) Explicit Continuous Finite Element Methods on Triangles, *SIAM Conference on Computational Science and Engineering (CSE17),* Atlanta, GA, February 2017.

(Invited) A Short Introduction to the Finite Element Approach to Unsteady PDEs, *University of Hartford,* Hartford, CT, March 2016.

(Invited) On the Existence of Bases Appropriate for Explicit Continuous Finite Element Methods on Triangles, *NASA Langley Research Center,* Hampton Roads, VA, August 2014.

Explicit Continuous hp-Finite Element Methods on Triangles, *International Conference on Spectral and High Order Methods (ICOSAHOM 2014),* Salt Lake City, NV, June 2014.

Relevant Skills

Software and Operating Systems: *Matlab, Octave, R, Darktable, Gimp, Maple, Blender, MAYA, Git, Subversion, Windows, Linux, Microsoft Suite*

Programming Languages: *C++, Fortran, HTML/CSS, Python, LaTeX, SQL*

Languages: *English (Native), German (Proficient)*

Teaching Experience

Clarkson University:

Co-Calculus I, *Roughly 10-50 Students per Section*
S'2017 (2 Sections), F'2016 (3 Sections), F'2012 (4 Sections), S'2012 (1 Section), F'2011 (3 Sections)

Co-Calculus II, *Roughly 5-50 Students per Section*
S'2017 (2 Sections), F'2016 (3 Sections), F'2012 (4 Sections), S'2012 (1 Section), F'2011 (3 Sections)

Calculus II, *Roughly 25-40 Students per Section*
S'2018 (4 Sections)

University of Hartford:

Calculus I, *Roughly 10-20 Students per Section*
F'2015 (2 Sections), F'2014 (2 Sections)

Calculus II, *Roughly 5-15 Students per Section*
S'2016 (3 Sections), S'2015 (3 Sections)

Advanced Engineering Mathematics, *Roughly 5-20 Students per Section*
S'2016 (1 Section), F'2015 (2 Sections), S'2015 (1 Section), F'2014 (2 Sections)

Awards & Honors

- **Travel Award** recipient to attend NAHOM Conference in San Diego in June 2019
- Recipient of **Best Presenter** Award MCCNNY 2017
- Winner of the **Sanda Briggs Award for Outstanding Mathematics Teaching Assistant** 2013, Clarkson University, no more than two recipients per year
- Recipient of **RESPECT** Award for skill and patience in teaching 2012, Clarkson University
- **Full Teaching Assistantship** 2009-2011, 2012-2014, and 2016-2017, Clarkson University
- **Full Research Assistantship** 2011-2012, and 2018-2019, Clarkson University

Memberships

Pi Mu Epsilon , *The National Honorary Mathematical Society*

SIAM , *The Society for Industrial and Applied Mathematicians*

MAA , *The Mathematical Association of America*

NAM , *The National Association of Mathematicians*