Justin Owen

Email: jowen6@gmail.com
Website: jowen6.github.io

Education

Texas A&M University College Station, TX
PhD. Mathematics *2014 - 2019*

- Research Area: Numerical Analysis
- Advisor: Dr. Alan Demlow
- Qualifying Exams Passed: Applied/Numerical Analysis & Real Analysis
- GPA: 3.84

Stony Brook University Stony Brook, NY
M.A. Physics *2011 - 2013*

- Research Area: Accelerator Physics
- Master's Thesis: "Simulation of Electron Beam Dynamics in the 22 MeV Accelerator for a Coherent Electron Cooling Proof of Principle Experiment"
- Advisor: Dr. Vladimir Litvinenko

Harriet L. Wilkes Honors College of Florida Atlantic Universtiy Jupiter, FL
B.A. Mathematics *2006 - 2010*

- Honors Thesis: "Boundary Value Problems for Harmonic Function on a Domain in the Sierpinski Gasket"
- Advisor: Dr. Terje Hoim

B.A. Physics *2006-2010*

- Honors Thesis: "The Effects of Nonlinear Media on Ultrasonic Waves"
- Advisor: Dr. Marc Hill

Research Interests

My current work revolves around solving eigenvalue problems for elliptic partial differential equations defined on surfaces using the finite element method. My interests range from the analysis of the convergence properties of these solutions to their parallel efficient implementation. I am particularly interested in analyzing adaptive approaches to these problems. One of my long term goals is to use these algorithms to assess geometric properties, particularly detecting defects of objects from the approximate spectrum of the Laplace-Beltrami operator.

Publications

1. A. Bonito, A. Demlow, and J. Owen, *A Priori Error Estimates for Finite Element Approximations to Eigenvalues and Eigenfunctions of the Laplace-Beltrami Operator*, ArXiv e-prints, (2018), `https://arxiv.org/abs/1801.00197` (Submitted to SIAM Journal on Numerical Analysis)

2. J. Owen and R. S. Strichartz, *Boundary value problems for harmonic functions on a domain in the Sierpinski gasket*, Indiana Univ. Math. J., 61 (2012), pp. 319–335

3. R. M. SCHMITT AND J. OWEN, *Acoustic impediography: Imaging surface acoustic impedance using 1-3 piezo-composite for integrated fingerprinting*, in Proceedings - Electronic Components and Technology Conference, 05 2011, pp. 1296–1299

Presentations/Posters

- *"A Brief Introduction to Finite Elements"* (Talk)
  - GIG'EM Conference, Texas A&M University March 2018
- *"Geometric Superconvergence in FEM Approximation of Eigenvalues of the Laplace-Beltrami Operator"* (Talk)
  - Finite Element Rodeo, Louisiana State University March 2018
- *"Geometric Superconvergence in the Surface Eigenvalue Problem"* (Poster)
  - International Conference on Current Trends and Challenges in Numerical Solutions of Partial Differential Equations, Purdue University July 2017
- *"Finite Element Approximation of Eigenvalue Clusters of the Laplace-Beltrami Operator"* (Talk)
  - SIAM Conference on Computational Science and Engineering, Atlanta, GA February 2017
- *"Boundary Value Problems on the Sierpinski Gasket"* (Poster)
  - Mathematical Association of America & American Mathematical Society joint conference, San Francisco, CA January 2010

Work Experience

- **Texas A&M University** — College Station, TX
  Graduate Teaching Assistant — *Aug. 2015 - Present*
  - Engineering Mathematics I (MATH 151) . . . . . 1 Semester
  - Numerical Methods (MATH 417) . . . . . 2 Semesters
  - Numerical Partial Differential Equations (MATH 610) . . . . . 1 Semester
- **Sonavation inc.** — Palm Beach Gardens, FL
  Research Associate — *Dec. 2013 - July 2014*
  - Worked in an ultrasound lab gathering data from test subjects to develop new biometrics based off of ultrasonic imaging. Designed experimental setups, programmed firing patterns for ultrasonic transducers, analyzed data using MATLAB, evaluated transducer quality using measurements with laser vibrometer. Documented the work in reports which were presented weekly. Helped mentor interns.

  Research Associate — *Aug. 2010 - July 2011*
  - Performed finite element analysis of ultrasonic and analyzed data from these numerical experiments using MATLAB. Documented findings in reports and presented them in weekly meetings. Mentored interns.

  Undergraduate Intern — *Aug. 2009 - Aug. 2010*
  - Performed finite element analysis of ultrasonic transducers and analyzed both experimental and numerical data using MATLAB.
- **Brookhaven National Lab** — Brookhaven, NY
  Graduate Research Assistant — *May 2013 - Dec. 2013*

  - Simulated the electron beam for coherent electron cooling proof of principle experiment and helped design the user interface for the coherent electron cooling experiment controls.

- **Stony Brook University** Stony Brook, NY
  Graduate Teaching Assistant *Aug. 2011 - May 2013*
  - Taught labs for calculus based physics 1 and 2 courses.

Computer Skills

- **Programming and Markup Languages**
  - **Intermediate:** C++, Python, LaTeX
- **Software**
  - **Expert:** MATLAB, PZFLEX, ASTRA, MS Excel, MS Word, MS Powerpoint
- **Github username**
  - jowen6

Awards, Grants & Honours

Texas A&M University Graduate Merit Fellowship 2014-2018
Harriet L. Wilkes Honors College Kenan Scholar 2009
Mathematics Association of America Certificate of Recognition 2009
Harriet L. Wilkes Honors College LIFE Scholar 2008-2009
Harriet L. Wilkes Honors College Fred and Kit Bigony Scholar 2007-2008

Conferences/Workshops Attended

- GIG'EM Conference, Texas A&M University March 2018
- Finite Element Rodeo, Louisiana State University March 2018
- International Conference on Current Trends and Challenges in Numerical Solutions of Partial Differential Equations, Purdue University July 2017
- SIAM Conference on Computational Science and Engineering, Atlanta, GA February 2017
- IMA PI Graduate Student Conference on FEM for Eigenvalue Problems, Michigan Technological University August 2016
- Finite Element Rodeo, Texas A&M University March 2016
- Geometric PDEs and Their Approximations Winter School, Texas A&M University January 2016
- United States Particle Accelerator School, Ft. Collins, CO June 2013
- Mathematical Association of America & American Mathematical Society joint conference, San Francisco, CA January 2010
- 42nd annual Mathematical Association of America meeting of the Florida section, Florida Gulf Coast University February 2009

- 41st annual Mathematical Association of America meeting of the Florida section, Florida Southern College February 2008
- 40th annual Mathematical Association of America meeting of the Florida section, Tallahassee Community College February 2007
- Mathematical Association of America & American Mathematical Society joint conference, New Orleans, LA January 2007