

Troy Lee Henderson, IV

Professor of Mathematics

University of **Mobile**

315 Weaver Hall • 5735 College Parkway • Mobile, AL 36613
(251) 442-2298 • thenderson@umobile.edu • <http://www.tlhiv.org>

Education

- **Doctor of Philosophy, Mathematics**, August 2005. Texas A&M University, College Station, TX
Dissertation: *Causal Equivalence of Frames*
Advisor: *David R. Larson*
- **Master of Arts, Mathematics**, August 1999. University of Alabama, Tuscaloosa, AL
Thesis: *The Construction and Application of Wavelet Analysis*
Advisor: *Zhijian Wu*
- **Bachelor of Science, Electrical Engineering**, May, 1997. University of Alabama, Tuscaloosa, AL
Advisor: *Robert W. Scharstein*

Postdoctoral Positions

- **Professor**, *May 2017 – present*
University of Mobile, Mobile, AL
- **Associate Professor**, *May 2013 – April 2017*
University of Mobile, Mobile, AL
- **Assistant Professor**, *August 2007 – April 2013*
University of Mobile, Mobile, AL
- **Assistant Professor, Davies Fellow**, *July, 2006 – June, 2007*
United States Military Academy, West Point, NY
- **Assistant Professor**, *July, 2005 – June, 2006*
United States Military Academy, West Point, NY

Predoctoral Positions

- **NSF Funded GK-12 Resident Mathematician**, *June, 2004 – December, 2004*
Texas A&M University, College Station, TX

The long-term goal of the NSF GK-12 program is to improve the content of science, technology, engineering, and mathematics (STEM) in rural grades 6-8. Graduate Fellows serve as role models and stimulate students' interest in STEM by conveying the excitement of research and discovery.

- **NSF VIGRE Research Assistant**, *September, 2003 – May, 2004*
Texas A&M University, College Station, TX
Advisor: *David R. Larson*

Developed strategies for the solution of problems in Linear Algebra, Operator Theory, and Analysis in the sub-area of wavelets and frames.

- **Graduate Teaching Assistant**, *September, 1999 – August, 2003*
Texas A&M University, College Station, TX
Instructed mathematics courses for engineering, business, and mathematics majors.
- **Graduate Teaching Assistant**, *January, 1998 – August, 1999*
University of Alabama, Tuscaloosa, AL
Instructed mathematics courses primarily for business and mathematics majors.
- **Online Signal Processing Course Webmaster**, *August, 1997 – December, 1997*
University of Alabama, Tuscaloosa, AL
Designed, constructed, and maintained the website for an online course in Signal Processing in the Department of Electrical Engineering.
- **Undergraduate Research Assistant**, *January, 1996 – May, 1996*
University of Alabama, Tuscaloosa, AL
Advisor: *Robert W. Scharstein*
Developed numerical transform methods for signals and systems.

Selected Publications

- *Modeling the Steeping of Southern Sweet Iced Tea*, Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations” (SIMIODE), 2016.
- *Modeling the Smoking Process of Southern Barbecue*, Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations” (SIMIODE), 2016.
- *User-friendly web utilities for generating L^AT_EX output and METAPOST graphics*, TUGboat, vol. 33 (2012), no. 1., pp. 48-52.
- *A beginner’s guide to METAPOST for creating high-quality graphics*, TUGboat, PracT_EX Proceedings, vol. 28 (2007), no. 1, pp. 84-90.
 ⟨ Editors requested simultaneous publication with PracT_EX Journal ⟩
- *A beginner’s guide to METAPOST for creating high-quality graphics*, PracT_EX Journal, (2006), no. 4.
 ⟨ Editors requested simultaneous publication with TUGboat PracT_EX Proceedings ⟩
- *Embedding fonts in METAPOST output*, TUGboat, vol. 26 (2005), no. 3, pp. 250-252.

Teaching Experience

- **Instruction** in elementary to advanced mathematics at University of Mobile (9+ years).
- **Instruction** in single and multi-variable Calculus at United States Military Academy (3 semesters).
- **Resident Mathematician** to Somerville Middle School, Somerville, TX. Served as a role model to stimulate students’ interest in mathematics by conveying the excitement of research and discovery (2 semesters).
- **Instruction** in Business Calculus at Texas A&M University (1 semester) and elementary mathematics courses at Texas A&M University (3 semesters).
- **Recitation** in Calculus for Engineers at Texas A&M University (8 semesters).
- **Mathematics Computer Laboratory Instruction** in Calculus for Engineers. Instructed students in the use of Maple (7 semesters) and Matlab at Texas A&M University (1 semester).

- **Graded** for Business Calculus at Texas A&M University (1 semester).
- **Instruction** in Pre-calculus and College Algebra at University of Alabama (2 semesters).

Professional Talks

- **TUG 2012**, July 16-18
The 33rd Annual Meeting of the T_EX Users Group
Omni Parker House, Boston, MA
- **American Mathematical Society 2008 Spring Southeastern Section Meeting**, March 29.
Special Session on Wavelets, Frames, and Multi-Scale Constructions
Louisiana State University, Baton Rouge, LA
- **Joint Mathematics Meetings**, January 7, 2007
AMS Special Session on Frames and Wavelets in Harmonic Analysis, Geometry, and Applications
New Orleans, LA
- **Joint Mathematics Meetings**, January 6, 2007
MAA Session on Communication Theory in Undergraduate Courses
New Orleans, LA
- **PracT_EX 2006**, July 31
Rutgers University, Piscataway, NJ
- **Colloquium, Department of Computer Science**, March 30, 2006
SUNY New Paltz, New Paltz, NY
- **American Mathematical Society 2005 Fall Western Section Meeting**, November 11-13
Special Session on Wavelets, Frames, and Related Expansions
University of Oregon, Eugene, OR
- **Great Plains Operator Theory Symposium 2005**, June 7-12
University of Central Florida, Orlando, FL
- **American Mathematical Society 2005 Spring Southeastern Section Meeting**, March 18-19
Special Session on Advances in the Study of Wavelets and Multi-wavelets
Western Kentucky University, Bowling Green, KY
- **Colloquium, Department of Mathematics**, November 10, 2004
University of Alabama, Tuscaloosa, AL
- **American Mathematical Society 2004 Fall Southeastern Section Meeting**, October 16-17
Special Session on Wavelets, Frames, and Sampling
Vanderbilt University, Nashville, TN

Promotion and Awards

- **Mitford Ray Megginson Reserch Award**, May, 2017
University of Mobile, Mobile, AL
- **Promotion to Rank of Professor**, May, 2017
University of Mobile, Mobile, AL
- **Promotion to Rank of Associate Professor**, May, 2013
University of Mobile, Mobile, AL

- **AUF Scholar**, September, 2004
Texas A&M University, College Station, TX
- **NSF GK-12 Graduate Fellow**, June 2004
Texas A&M University, College Station, TX
- **NSF VIGRE Research Assistant Fellow**, September 2003
Texas A&M University, College Station, TX
- **Engineering Science and Mechanics Honor Society**, January 1997
University of Alabama, Tuscaloosa, AL
- **Undergraduate Research Scholar**, January 1996
University of Alabama, Tuscaloosa, AL

Selected Software Developments

- **PRAXIS Scores Report Calculator** <developed for Carolyn Corliss>
Generates reports for State of Alabama certification requirements
- **Function Grapher** <<http://www.tlhiv.org/mpgraph>>
Allows users to easily graph functions, parametric curves, and surfaces
- **MetaPost Previewer** <<http://www.tlhiv.org/mppreview>>
Tests METAPOST code and generates EPS, PDF, and SVG output for the generated graphics
- **LaTeX Previewer** <<http://www.tlhiv.org/ltxpreview>>
Used to experiment with LaTeX without concern for installation and compilation processes
- **Numerical Integrator** <<http://www.tlhiv.org/integration>>
Computes the definite integral of a mathematical function numerically
- **Gaussian Quadrature Nodes and Weights** <<http://www.tlhiv.org/quadrature>>
Numerically computes Gaussian quadrature nodes and weights for any order
- **Root Finder** <<http://www.tlhiv.org/rootfinder>>
Locates a root of a real-valued mathematical function on a given interval
- **Quadratic Factorer** <<http://www.tlhiv.org/factor>>
Demonstrates the process of factoring quadratics over the integers
- **Simple Polygon Calculator** <<http://www.tlhiv.org/polygon.html>>
Calculates the perimeter, area, and centroid of simple polygons
- **Rational Representation of Real Numbers** <<http://www.tlhiv.org/rational>>
Computes rational approximations of real numbers
- **Loan Calculator** <<http://www.tlhiv.org/LoanCalculator>>
Computes the principal, payment, interest rate, or term for compound interest loans

Computer Languages and Applications

- **Programming/Markup Languages:** BASH, C, HTML, JavaScript, and Perl
- **Typesetting:** L^AT_EX, METAPOST, T_EX, and ConT_EXt
- **Operating Systems:** Linux, Unix, and Microsoft Windows
- **Mathematics Applications:** Maple, Mathematica, Maxima, Matlab, and Octave
- **Desktop Applications:** Gimp/Photoshop, Inkscape/Illustrator, and standard office applications