Steven Craig Clontz, Jr.

University of North Carolina at Charlotte — Department of Mathematics and Statistics
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Education

Doctor of Philosophy, Mathematics, Auburn University   *May 2015*
Dissertation: *Limited information strategies for topological games*, under Gary Gruenhage
GPA: 4.00
Fitzpatrick Fellow in Topology (2012-13, 2014-15), DMS Teaching Citation (2014-15)

Master of Science, Mathematics, Auburn University   *December 2010*
Thesis: *Applications of stationary sets in set theoretic topology*, under Gary Gruenhage
GPA: 4.00

Bachelor of Science, Mathematics, Auburn University   *May 2008*
Honors Thesis: *The edge unfolding of generalized pyramids*, under Andras Bezdek
GPA: 3.88
Summa Cum Laude, University Honors Scholar, Dean's Medalist, Undergraduate Research Fellow
Phi Kappa Phi, Phi Beta Kappa

Specialties and Interests

- Set-theoretic topology

- Continuum theory

- Game theory

- Cyberinfrastruture of mathematics research and education

- Mathematical puzzles and games in education and outreach

- Active and inquiry-based learning

Employment and Professional Experience

- **Visiting Assistant Professor**, University of North Carolina at Charlotte (August 2015 - present)

- **Director and Founder**, Mathematical Puzzle Programs (May 2015 - present)

- **Technology Consultant**, The National Museum of Mathematics (April 2015 - August 2015)

- **Founder and Software Engineer**, Teloga LLC (August 2011 - July 2015)

- **Graduate Teaching Assistant and Instructor**, Auburn University Department of Mathematics (August 2008 - May 2015)

- **Specialist IV - Information Technology**, Auburn University Office of University Writing (January 2014 - May 2014)

- **Mathematics Instructor**, Southern Union State Community College (August 2013 - May 2014)

Papers

- *Proximal compact spaces are Corson compact.* Topology Appl. 173 (2014), 18 (with G. Gruenhage).

- *On k-tactics for Gruenhage's compact-point game.* Q&A in Gen. Topology (accepted)

- *Destruction of metrizability in generalized inverse limits.* Topology Proc. (accepted, with S. Varagona)

- *Tactic-proximal compact spaces are strong Eberlein compact.* (submitted)

- *Game-theoretic strengthenings of Menger's property.* (in preparation)

- *Almost compatible functions and topological games.* (in preparation)

Selected Presentations

- *Applications of almost compatible functions for limited information strategies in infinite length games*, presentation for Boise Extravaganza in Set Theory at San Francisco State University (June 2015)

- *IBL and Mathematical Puzzlehunt Competitions*, presentation for Legacy of R.L. Moore Conference at the Univeristy of Texas (June 2015, with PJ Couch)

- *Limited information strategies for a topological proximal game*, presentations for the AMS Sectional Mathematics Meeting at the University of Alabama at Huntsville (March 2015) and the 49th Spring Topology and Dynamics Conference at UNC Greensboro (May 2015)

- *Game-theoretic strengthenings of Menger's property*, presentations for the 29th Summer Topology Conference at CUNY Staten Island (July 2014) and the AMS Fall Southeastern Sectional Meeting special session on Set Theoretic Topology (November 2014)

- *Finite and infinite games / Undergraduate research and grad school*, invited presentation at Lamar University (June 2014)

- Assorted presentations on set theory, game theory, and topology, for Auburn University REU in Algebra and Discrete Mathematics (Summers 2010-2015)

- *The edge unfolding of generalized pyramids*, presentation for the National Conference for Undergraduate Research (Spring 2008)

Coursework and Seminars

- General Topology
- Set Theoretic Topology
- Continuum Theory
- Axiomatic Set Theory
- Descriptive Set Theory
- Euclidean Geometry
- Game Theory
- Knot Theory
- Category Theory
- Graph Theory
- Enumeration
- Functions of Complex Variables
- Vietoris Homology
- Simplicial Homology
- Technology in Secondary Mathematics Education

Teaching

- **Intermediate Algebra — MTH-098 (Southern Union)**

  Hybrid lecture/lab course in developmental algebra using the ALEKS learning management system.

- **Calculus for Engineering Technology — MATH-1121 (UNC Charlotte)**

  Topics covered: elements of differential and integral calculus for polynomial, rational, exponential, logarithmic and trigonometric functions, with applications to engineering.

- **(Honors) Calculus I — MATH-1610/1617 (Auburn University)**

  Topics covered: limits; the derivative of algebraic, trigonometric, exponential, and logarithmic functions; applications of the derivative, antiderivatives, the definite integral; applications to area problems; the fundamental theorem of calculus.

  For honors sections, students created a capstone project and presentation illustrating the application of calculus to their own field of study or interests.

- **Calculus II — MATH-1620 (Auburn University)**

  Topics covered: techniques of integration, applications of the integral, parametric equations, polar coordinates, vectors, lines and planes in space, infinite sequences, and series.

  Developed inquiry-based learning notes available on GitHub.

- **(Honors) Calculus III — MATH-2630/2637 (Auburn University)**

  Topics covered: vector-valued functions, partial derivatives, multiple integration, and vector calculus.

  For honors sections, students were assigned to research and present topics and examples during lecture (with optional assistance from the instructor). Developed inquiry-based learning notes available on GitHub.

- **Calculus IV — MATH-2242 (UNC Charlotte)**

  Topics covered: functions $\mathbb{R}^n \to \mathbb{R}^m$, vector fields, line and surface integrals; Green's theorem, Divergence theorem, Stokes' theorem and applications.

- **Intermediate Euclidean Geometry I — MATH 5380 (Auburn University)**

  Topics covered: fundamental concepts and theorems of Euclidean geometry, introduction to higher dimensions; regular polygons and polyhedra, symmetry groups, convexity, geometric extremum problems; geometric transformations and their invariants.

  Used inquiry-based learning notes written by Andras Bezdek and Wlodzimierz Kuperberg.

Selected student comments (Auburn University 2014-2015):

- "Calc 2 is definitely a hard course but Mr. Clontz taught it in a way that made it easier to understand. Very glad he was my professor for the semester."

- "Fantastic teacher that had a very cool and unique teaching style that made everything very clear."

- "This was an interesting style [active learning] of class. I think that if it is implemented more frequently, it could really help future students understand and retain the material."

- "Great grading system. Great guy. Great class."

Students

- **Tanyce James - Senior Project (UNC Charlotte, 2015-present)**

  An investigation of finite and infinite combinatorial games.

Outreach

- **MaPP (Mathematical Puzzle Programs)** (2015-present)

  Founded to bring mathematical puzzle competitions like LaMP and A.M.P.'d to campuses across the nation, and provide free mathematical puzzle materials for teachers to use in the classroom. Responsible for the MaPP High School Challenge and MaPP Middle School Challenge competitions to be ran throughout the 2016-2017 school year. Website at MaPPmath.org.

- **LaMP (Lamar University Mathematical Puzzlehunt)** (2014-2015)

  Developed original mathematical puzzle-solving competition for high school students. Includes a logic-based physical challenge and several smaller mathematics puzzles, each of which gives clues for an overarching mathematical meta-puzzle.

- **AU Explore - Math EXPO** (2009-2013)

  Developed several twenty-minute workshop activities for fifth grade students involving number theory, game theory, geometry, and graph theory. Organized a volunteer staff of over a dozen graduate and undergraduate student volunteers to present these activities to rotating groups of students throughout the each annual event.

- **A.M.P.'d (Auburn Mathematical Puzzle) Challenge** (2012-2013)

  Co-created annual puzzlehunt-inspired mathematics competition for middle school students, serving as event coordinator and puzzle designer for the January 2012, September 2012, and September 2013 competitions.

- **War Eagle BEST Robotics Competition** (Judge, 2013)

- **AU Science Olympiad for Elementary School** (Event Designer, 2013)

- **AU Science Olympiad for Middle School** (Event Organizer, 2011-2012)

Cyberinfrastructure and Software Development

- **Online Seminars in Mathematics (OSM)**

  Initiative to bring online streaming of mathematical content using free and open-source software and minimal hardware. Applying for NSF funding. Project hosted at osm.clontz.org.

- **π-Base Topology Database**

  Contributor and consultant. Developing undergraduate research experience to populate database with modern topological results. Applying for NSF funding with Ziqin Feng (Auburn University). Project hosted at topology.jdabbs.com.

- **Teloga.com**

  Co-developed the customer relationship management (CRM) web application Teloga.com for collegiate music organizations.

- **Open Source Software**

  Contributor to several OSS repositories in addition to the above through the active GitHub account @StevenClontz.

- **Programming and Markup Languages**

  HTML5 (Markdown, HAML, Slim), CSS (LESS, SASS), Javascript (Coffeescript, jQuery, AngularJS), PHP (Wordpress, Wolf CMS), Python (Django), Ruby (Rails, Sinatra, nanoc), LaTeX, Git, Firebase, SQL (MySQL, PostgreSQL, SQLite), Data Serialization (JSON, YAML)