

LEE STEMKOSKI

CURRICULUM VITAE

Department of Mathematics and Computer Science
Adelphi University – Garden City, NY 11530

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Experience

- Professor, Adelphi University Fall 2017 – Present
- Associate Professor, Adelphi University Fall 2012 – Spring 2017
- Assistant Professor, Adelphi University Fall 2006 – Spring 2012
- Lecturer, Dartmouth College Fall 2003 – Spring 2006

Education

- Ph.D. in Mathematics, Dartmouth College June 2006
- M.A. in Mathematics, Dartmouth College June 2003
- M.A. in Mathematics, Boston University May 2001
- B.A. in Mathematics, Boston University May 2001

Scholarly Interests

- Virtual Reality and Augmented Reality
- Three-Dimensional Computer Graphics
- Multimedia and Video Game Development
- History of Mathematics and Digital Archiving
- Number Theory and its Applications

Publications

Books:

- Stemkoski, L. *Java Game Development with LibGDX*. (second edition)
New York: Apress, 2018. ISBN: 978-1484233245.
- Stemkoski, L. and Leider, E. *Game Development with Construct 2*.
New York: Apress, 2017. ISBN: 978-1484227831.

Articles:

- Schinina, V. and Stemkoski, L. “Parameterizations of Fractal-like Knots.”
In preparation.
- Giuffre, C. and Stemkoski, L. “Virtual Temari: Artistically Inspired Mathematics”.
To appear in *Journal of Humanistic Mathematics.*, 2020

- Stemkoski, L. "Introduction to JavaFX for Game Development".
GameDevelopment.TutsPlus.com (2015)
- Bloch, S. and Stemkoski, L. "Functional Game Programming in Java-Based CS1".
Journal of Computing Sciences in Colleges, Volume 29 (2), 2013
- Bradley, R. and L. Stemkoski, "When Nine Points are Worth But Eight: Euler's Resolution of Cramer's Paradox". *Convergence*, Volume 8 (2011).
- Klyve, D., Stemkoski, L., and E. Tou, "Teaching and Research Using Original Sources from the Euler Archive". *Convergence*, Volume 8 (2011).
- Stemkoski, L. "Parameterized Knots",
Loci: Featured Items, December 2010.
- Stemkoski, L., and C. Storm, "Applets and Activities for Real Analysis",
Loci: Resources, September 2009.
- Stemkoski, L. "Teaching Time Savers: The Homework Self-Evaluation Challenge",
FOCUS: The Newsletter of the Mathematical Association of America, Aug/Sept 2009, 13.
- Stemkoski, L. and E. Tou, "Explicit Constructions of Arithmetic Lattices in $SL(3, \mathbb{R})$ ",
International Journal of Mathematics and Computer Science 4 (2009), no. 1, 53 – 64.
- Stemkoski, L. "Investigating Euler's Polyhedral Formula Using Original Sources",
Convergence, Volume 6 (2009).
- Klyve, D. and L. Stemkoski, "Graeco-Latin Squares and a Mistaken Conjecture of Euler",
College Mathematics Journal, Volume 37 (2006), 2 – 15.
- Kim, P., L. Stemkoski, and C. Yuen, "Polynomial Knots of Degree Five",
MIT Undergraduate Journal of Mathematics, Volume 3 (2001), 125 – 135.

Book Chapters:

- Klyve, D. and L. Stemkoski, "The Euler Archive: Giving Euler to the World",
in *Euler at 300: An Appreciation*, Bradley et. al. (ed.), Mathematical Assoc. of America, 2007.
- Lathrop, C. and L. Stemkoski, "Parallels in the work of Leonhard Euler and Thomas Clausen",
in *Euler at 300: An Appreciation*, Bradley et. al. (ed.), Mathematical Assoc. of America, 2007.
- Klyve, D. and L. Stemkoski, "Graeco-Latin Squares and a Mistaken Conjecture of Euler",
in *The Genius of Euler: Reflections on his Life and Work*, W. Dunham (ed.), Mathematical Assoc. of America, 2007.

Book Reviews:

- Stemkoski, L., Review of Geometry with an Introduction to Cosmic Topology, by M. Hitchman,
Reviewed in *The MAA Mathematical Sciences Digital Library*, December 2009.
- Stemkoski, L., Review of In Search of the Riemann Zeros, by M. Lapidus,
Reviewed in *The MAA Mathematical Sciences Digital Library*, June 2008.
- Stemkoski, L., Review of The Art of Mathematics, by J. P. King,
Reviewed in *The MAA Mathematical Sciences Digital Library*, January 2008.
- Stemkoski, L., Review of The Early Mathematics of Leonhard Euler, by C. E. Sandifer,
Reviewed in *The MAA Mathematical Sciences Digital Library*, March 2007.

Theses:

- The Selberg Trace Formula for Cocompact Arithmetic Groups in $SL(3, \mathbb{R})$,
Ph.D. Thesis, Department of Mathematics, Dartmouth College (2006).
- The Rubik Groups of Polyhedra,
Senior Thesis, Department of Mathematics, Boston University (2001).

Additional Material:

- *Koala's Quest*. (video game)
Published in Google Play store April 2014; over 250,000 installations as of August 2016.
- Co-Director, *The Euler Archive*. (Digital library and database for the works of Leonhard Euler, consisting of approx. one thousand web pages, <http://eulerarchive.maa.org/>.)
part of the Mathematical Association of America Digital Library. 2003 – 2010
- Interviewed for "The Euler Archive: An Interview with the Founders",
FOCUS: The Newsletter of the Mathematical Association of America, January 2007.

Presentations

- *Energy, Space, and Light: The Math and Science Behind the Art* Aug., Sep. 2019
Nassau County Museum of Art (Gallery Talks) – Roslyn, NY
- *What's in a Game? The Art and Science of Video Games* May 2019
Amity University 3Continent Lecture Series – Garden City, NY
- *Virtual and Augmented Reality Applications for Math Education*, Jan. 2018
Contributed Paper Session, Joint Mathematics Meetings – Baltimore, MD
- *Rendering Photorealistic Knots: Theory and Practice* Jan. 2015
Contributed Paper Session, Joint Mathematics Meetings -- San Antonio, TX
- *Leonhard Euler's Work in Number Theory and the Commentationes Arithmeticae* Apr. 2014
Invited Talk, The Pohle Colloquium, Adelphi University -- Garden City, NY
- *Classifying Families of Polynomial Knots*, Jan. 2014
Contributed Paper Session, Joint Mathematics Meetings -- Baltimore, MD
- *The Work of Leonhard Euler related to Fermat's Last Theorem* Jan. 2013
Contributed Paper Session, Joint Mathematics Meetings -- San Diego, CA
- *The Work of Leonhard Euler related to Fermat's Last Theorem* Dec. 2012
Invited Talk, The Pohle Colloquium, Adelphi University – Garden City, NY
- *Number Theory and Quadratic Forms in the Work of Leonhard Euler* Aug. 2012
Invited Talk, The Euler Society Conference, Adelphi University -- Garden City, NY
- *The Coefficient Space of Polynomial Knots* Jan. 2012
Contributed Paper Session, Joint Mathematics Meetings – Boston, MA
- *Applications of Calculus to Game Theory: The Prisoners' Dilemma* Jan. 2011
Contributed Paper Session, Joint Mathematics Meetings – New Orleans, LA
- *Alternative Forms of Assessment in Mathematics* Jan. 2010
Invited Panelist, Joint Mathematics Meetings – San Francisco, CA
- *Online Articles From J.O.M.A. to Loci* Jan. 2010
Invited Panelist, Joint Mathematics Meetings – San Francisco, CA
- *Agent-Based Models of Population Segregation* Oct. 2009
Faculty Works in Progress Seminar, Adelphi University – Garden City, NY
- *Analyzing Strategies for Interaction: Game Theory in a Calculus Course* Aug. 2008
Contributed Paper Session, MathFest 2008 – Madison, WI

- *Agent-Based Models of Species Interaction and Reproduction* Dec. 2007
Interdisciplinary Science Symposium, Adelphi University – Garden City, NY
- *The Unpublished Notebooks and Manuscripts of Leonhard Euler* Dec. 2007
Invited Talk, The Pohle Colloquium, Adelphi University – Garden City, NY
- *Cataloging and Publishing Euler's Works: A History* Aug. 2007
Invited Paper Session, MathFest 2007 – San Jose, CA
- *The Euler Archive: Illuminating the Life and Times of Leonhard Euler* Apr. 2007
Invited Keynote Address, Embassy of Switzerland – Washington DC
- *Investigating Euler's Polyhedral Formula Using Original Sources* Jan. 2007
Joint Mathematics Meetings – New Orleans, LA
- *The Fuss Index vs. the Enestrom Index: an Euler Archive Update* Aug. 2006
Euler 2K+6 Conference – Albany, NY
- *The Prisoners' Dilemma and the Evolution of Cooperation* Feb. 2006
Norwich University colloquium series – Northfield, VT
- *A Trace Formula for Compact Quotients of $SL(3, R)$ and Weyl's Law* Jan. 2006
Joint Mathematics Meetings – San Antonio, TX
- *From the Riemann zeta function to the Selberg trace formula* Oct. 2005
Middlebury College mathematics department seminar – Middlebury, VT
- *Simulating Evolution using the Iterated Prisoner's Dilemma* July 2005
Dartmouth graduate student seminar – Hanover, NH
- *A Trace Formula for Cocompact Arithmetic Groups* Mar. 2005
Automorphic Forms Workshop – Denton, TX
- *Thomas Clausen: Factoring Fermat Numbers and Generating Graeco-Latin Squares* Nov. 2004
Invited speaker, special session, AMS sectional meeting – Pittsburg, PA
- *Reality Calculus: Critical Thinking and Organized Writing* Aug. 2004
Contributed paper session, MathFest 2004 – Providence, RI
- *Hilbert's Tenth Problem and Number Theory* May 2004
Senior seminar in mathematics, Dartmouth College – Hanover, NH
- *Why Graduate School and How to Get There* Mar. 2003
Invited panelist, RUMBUS 2003 – Boston, MA
- *Complex Multiplication on Elliptic Curves* 2003 – 2005
Ten Reasons the p -adic Numbers are Cool
Applications of Hecke L -functions
Selected talks, Dartmouth College Number Theory Seminar – Hanover, NH
- *Graeco-Latin Squares and a Conjecture of Euler* Aug. 2002
Euler 2K+2 conference – Rumford, ME
- *The Rubik Groups of Polyhedra* Apr. 2001
HRUMC VIII – Saratoga Springs, NY
- *An Ode to Polynomial Knots* Mar. 2001
Boston University Masterclass series – Boston, MA
- *Polynomial Knots of Fifth Degree* Jan. 2001
Poster session, Joint Mathematics Meetings – New Orleans, LA
- *Polynomial Knots* Nov. 2000
MAA sectional meeting – Providence, RI

Teaching

(All courses taught at Adelphi University)

Computer Science:

- CS 137: Introduction to Video Game Programming
- CS 156: Discrete Structures
- CS 171: Introduction to Computer Programming (Java)
- CS 174: Computer Organization and Assembly Language
- CS 233: Graphical User Interfaces
- CS 237: Video Game Programming
- CS 270: Survey of Programming Languages
- CS 290: Software Seminar (Topic: Unity and C#)
- CS 290: Software Seminar (Topic: Interactive Fiction)
- CS 290: Software Seminar (Topic: JavaScript Game Development)
- CS 290: Software Seminar (Topic: Python Game Development)
- CS 302: Artificial Intelligence
- CS 333: Computer Graphics and Image Processing
- CS 387: Video Game Development Workshop
- CS 390: Special Topics: Cryptography
- CS 633: Virtual Reality and Augmented Reality

Mathematics:

- Math 141: Calculus 1 (Differential)
- Math 142: Calculus 2 (Integral)
- Math 190: Freshman Mathematics Seminar
- Math 243: Calculus 3 (Multivariable)
- Math 244: Differential Equations
- Math 250: Multivariable Mathematics
- Math 253: Linear Algebra
- Math 290: Math Honors Seminar (Topic: Mathematics of Origami)
- Math 290: Math Honors Seminar (Topic: Topics in Modern Algebra)
- Math 301: Proofs and Abstract Reasoning
- Math 321: Geometry (Euclidean and Non-Euclidean)
- Math 326: History of Mathematics
- Math 351: Number Theory
- Math 365: Advanced Mathematical Modeling
- Math 390: Special Topics: Mathematical Biology
- Math 390: Special Topics: Actuarial Science
- Math 431: Analysis
- Math 457: Abstract Algebra
- Math 490: Special Topics: Abstract Algebra 2 (Galois Theory)
- Math 601: Data Science
- Math 656: History of Mathematics

Other:

- Honors 486: Liberal Arts Seminar: Complexity

Course and Program Development:

- Designed and implemented interdisciplinary Minor in Digital Studies with Department of English and University Library Faculty
- Designed and implemented interdisciplinary Minor in Video Game Design with Department of Art and Art History and Department of Communications
- Math 365: Advanced Mathematical Modeling
Redesigned course to serve as a general education capstone experience; introduced intensive technology (usage and creation), writing, and presentation components.
- Designed and taught courses in game design and development at all levels
- Honors 486: Liberal Arts Seminar: Complexity
Designed and taught interdisciplinary course, accessible to all majors.

Faculty Development Mini-Courses:

- Evolutionary Game Theory Jan. 2011
American Mathematical Society, Short Course – New Orleans, LA
- The Great Books of Mathematics Jan. 2010
American Mathematical Society, Short Course – San Francisco, CA
- Financial Mathematics Aug. 2009
Mathematical Association of America, Short Course – Portland, OR
- Game-Theoretic Modeling: Techniques and Applications Aug. 2008
Mathematical Association of America, Short Course – Madison, WI
- Biological Applications and Mathematical Modeling Aug. 2007
Project NExT workshop – San Jose, CA
- Modeling Across the Curriculum Aug. 2006
Project NExT workshop – Knoxville, TN
- Computation and Discovery in the Number Theory Classroom Jan. 2004
Mathematical Association of America, Minicourse – Phoenix, AZ
- The Mathematics of Leonhard Euler Jan. 2004
Mathematical Association of America, Minicourse – Phoenix, AZ
- The Mathematics of Cryptography Aug. 2002
Mathematical Association of America, Short Course – Burlington, VT
- Methods of Proof in Group and Graph Theory Aug. 2000
Mathematical Association of America, Minicourse – Los Angeles, CA

Undergraduate Research Directed:

¹ indicates project was basis for student's Honors College thesis

² indicates project was presented by students at a national conference

2019 – 2020

- “Agent-Based Models and Genetic Algorithms”, with Jennefer Maldonado
- “Parameterizations of Fractal-like Curves”, with Vincent Schinina ⁽²⁾
- “3D Videography and Virtual Reality”, with Paul Maurantonio
- “Psychological Effects of Loot Boxes in Video Games”, with Thomas Dayton ⁽¹⁾

2018 – 2019

- "Augmented Reality: Theory and Applications", with Ryan Barrett ⁽¹⁾
- "Virtual Reality Video Game Development", with Evan Leider

2017 – 2018

- "Interactive Literature: Creation and Context", with Caitlin Lenhan ⁽¹⁾
- “Adaptive Learning Technology in Mathematics Education”, with Emily Harris ⁽¹⁾

2016 – 2017

- “Adelphi University: 3D Multiplayer Simulation”,
with Mathew Mallory, Robert Monteleone, and Justin Pedowitz

2014 – 2015

- "Understanding the Fourth Spatial Dimension via Interactive Software", with Cécile Cornelus ⁽¹⁾
- "Creating a 3D Computer Graphics Engine", with Matthew Matero

2013 -- 2014 (none -- Sabbatical Leave of Absence)

2012 – 2013

- "Hyperbolic Geometry and the Art of M.C. Escher", with Julia Huntermark ⁽¹⁾
- "Generalized Self-Similar Curves", with Carissa Brtalik and Magdalena Mulvihill ⁽²⁾

2011 – 2012

- "Polynomial Knots", with Anthony Del Latto, Dayna Goeringer, and Steven Roveto ⁽²⁾
- "Evolution and Population Dynamics in Game Theory", with Tara Gangarossa ⁽²⁾
- "Efficiency of Algorithms for Solving Rubik's Cube with Abstract Algebra", with Nicolas Micelli ⁽²⁾
- "Hinton and the Fourth Spatial Dimension", with Samuel C. Herwood ^{(1),(2)}
- "Hyperbolic Curve Cryptography", with Katherine Weiss ⁽²⁾

2010 – 2011

- "Polynomial Knots of Degree Seven", with Salvatore Giunta and Kavi Gupta ⁽²⁾
- "Generalizations of the Prisoners' Dilemma", with Rachel Sherman ⁽²⁾
- "Rubik Groups of Dual Polyhedra", with Corinna Venezia ⁽²⁾

2009 – 2010

- "Telescopic Proofs and Fermat's Last Theorem", with Christopher Kirk
- "Group Structure of Rubik-like Puzzles (Octahedra)", with Shannon Zeckzer ⁽²⁾

2008 – 2009

- "Agent-Based Simulations of the Anasazi Culture", with Nicole Alves ^{(1), (2)}
- "Group Structure of Rubik-like Puzzles (Prisms)", with Jaclyn Bogensberger ^{(1), (2)}
- "Geometry of the Parameter Space of Polynomial Knots", with Adam Schoepfin ⁽¹⁾

2007 – 2008

- "Game-Theoretic Agent-Based Models and Evolution of Behavioral Strategies", with Edwin Chen ⁽¹⁾
- "Many-Option Games and Genetic Algorithm-Based Simulation Models of Social Interaction", with Joseph Dilallo ⁽¹⁾
- "A Comparative Analysis of Traditional Economic Theory and Complexity Economics", with Akhil Ketkar ⁽¹⁾

2005

- "Agent-Based Modeling", with six undergraduates in a term-long project. Investigated agent-based models of natural selection and the evolution of behavioral strategies using game theory and computer simulation. Students read research articles, presented in a weekly seminar, and created a simulation program for data generation.

Other Teaching-Related Activities:

- Project NExT Fellow 2006 – 2007
Project NExT (New Experiences in Teaching) is a national professional development program for new and recent Ph.D.'s interested in improving the teaching and learning of undergraduate mathematics. It addresses the full range of faculty responsibilities in teaching, research, and service.
- Teaching Seminar, Dartmouth College Summer 2003
Intensive ten-week seminar explored the theory and practice of teaching mathematics. Involved readings and discussions of different philosophies of teaching and problem solving. Topics included cooperative learning, using writing assignments, student evaluation, presentation styles, and designing curricula.
- Exploring Mathematics Summer 2003
Co-taught two week-long workshops in number theory and group theory for high school students.

Grants

- Developing 3D Graphics Frameworks in Python and OpenGL: An Open-Access Textbook, Epic Games Education MegaGrant – Application Under Review
- Augmented Reality Applications in Science and Math Education Applications
Sony USA Foundation – Application Under Review
- Virtual Reality: Experiences and Education,
with Cindy Maguire, Ann Holt, and John Drew
Amount: \$4,800 – Adelphi Collaborative Faculty Development Grant 2019
- MSP-Start: Science and Math Applied Real-problem Teaching,
with Sean Bentley (P.I.), Brumsic Brandon, and Elizabeth DeFreitas,
Amount: \$299,012 – National Science Foundation 2009
- P.I., Excelsior Scholars Program, with Beth Christensen, Gary Schecter, and Andrea Ward
Amount: \$52,390 – New York State Department of Education 2008
- P.I., Development of The Euler Archive, with Dominic Klyve,
Amount: \$10,000 – Swiss House for Advanced Research and Education 2007
Amount: \$10,000 – State Secretariat for Education and Research, Bern, Switzerland 2005
Amount: \$5,000 – Swiss House for Advanced Research and Education 2005
Amount: \$5,000 – Presence Switzerland 2003

Service

University:

- Vice-Chair, Faculty Senate 2019 – Present
- Department Faculty Senator 2019 – Present
- Faculty Representative, Commencement Committee 2019 – Present
- Chair, Senate Committee on Admissions and Retention 2017 – 2020
- Associate Provost for Student Success Search Committee 2018 – 2019
- College of Arts and Sciences Academic Affairs Committee 2010 – 2011
- Arts and Sciences Dean Search Committee 2009 – 2010

Department:

- Unit Peer Review Committee, Mathematics and Computer Science 2012 – Present
- Unit Peer Review Committee, Chemistry 2019 – 2020
- Various Curriculum Development, Evaluation, and Revision Committees
(including BA, BS, MS programs in both Mathematics and Computer Science) 2011 – Present
- Department Faculty Search Committees, 16 total (12 tenure-track, 4 visiting positions) 2007 – Present

Advising:

- Academic Adviser, (approx. 30-40 advisees yearly) 2006 – Present
- Adviser for student chapter of International Game Developers Association 2016 – Present
- Adviser for G.A.M.E.S. club 2012 – 2020
- Adviser for MAA Student Chapter at Adelphi 2011 – 2012
- Adviser for Putnam Examination Team 2010 – 2011
- Adviser for Mathematics and Computer Science Club 2006 – 2009

Local:

- Board of Advisers, Chimes Broadcasting, Inc. Aug. 2019 – Present
- Long Island Children’s Museum (STEM weekend outreach activity) Jan. 2019
- Outreach to local area schools (presentations on topics in computer science):
 - Ward Melville High School May 2019
 - Bayside High School May 2017, May 2018, May 2019
 - Roslyn Middle School Nov. 2017, Dec. 2017, Jan. 2019
 - Roslyn High School Oct. 2017
 - Kellenberg High School Feb. 2017
- CodeLL.org (organization for teaching children on Long Island how to code) Nov. 2014, Jan. 2016
 - Workshop leader – Garden City, NY
- Greater Metropolitan New York Math Fair Mar. 2009
 - Reader and Judge – Brooklyn, NY
- Co-Organizer, History of Mathematics, Special Session Oct. 2008
 - AMS Eastern Section Fall Meeting – Middletown, CT
- Long Island Junior Science and Humanities Symposium Apr. 2007, Apr. 2008
 - Reader and Judge – Garden City, NY
- Co-Organizer, Special Session, History of Math on Leonhard Euler's Tercentenary Apr. 2007
 - AMS Eastern Section Spring Meeting – Hoboken, NJ

National:

- Associate Editor, *Convergence* 2013 – 2017
- MAA Liaison for Adelphi University 2009 – 2015
- Reviewer for *Journal of Computational Science Education* 2009 – 2010
- Reviewer for *MAA Reviews* 2007 – 2009
- Judge, Undergraduate Poster Session, Joint Mathematics Meetings 2007
- Co-Organizer, Special Session, Joint Mathematics Meetings 2007
 - Topic: Creating and Sustaining Active Mathematics Clubs

Awards

- Upsilon Pi Epsilon (National Computer Science Honor Society) 2019
- Adelphi University Teaching Excellence Award (for tenured faculty) 2017
- Sabbatical Release Time 2014
 - Topic: Computer Graphics and Data Visualization
- Adelphi University Teaching Excellence Award (for tenure-track faculty) 2011
- Research Release Time, Adelphi University 2011
 - Topic: Development of Agent-Based Modeling Software
- Funded participant, Computational and Mathematical Biology, Sweet Briar College 2007
 - Week-long workshop, funded by Mathematical Association of America and NSF
- Project NExT Fellow 2006
- Dartmouth College Graduate Teaching Award 2005
- Funded participant, Clay Mathematics Institute Summer School, the Fields Institute 2003
 - Topic: Harmonic Analysis, The Trace Formula and Shimura Varieties.
- GAANN Fellowship, Dartmouth College 2004 – 2005
- Dartmouth College Graduate Fellowship 2001 – 2004
- Phi Beta Kappa (National Honor Society) 2001
- Boston University College Prize in Mathematics 2001
- Pi Mu Epsilon (National Mathematics Honor Society) 2000
- Funded participant, Research Experience for Undergraduates, Mount Holyoke College 2000
 - Topic: Singularities and Knots in Real Algebraic Geometry.

Additional Information

- Mathematical Software: Maxima, Maple, GeoGebra, TeX, LaTeX
- Programming Languages: Python, Java, JavaScript, OpenGL, HTML5, C++, C#, Racket, Prolog, NetLogo
- Society of Actuaries examination #1 (P) passed
- Languages: French (reading)