

# Curriculum Vitae

ANIL VENKATESH

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## Education/Employment

- 2015 – Assistant Professor of Mathematics, Ferris State University
- 2015 Ph.D. Duke University, Mathematics (advisor: Richard Hain)  
Thesis: *Triple Products of Eisenstein Series*  
Certificate in College Teaching
- 2009 B.A. University of Pennsylvania, Mathematics (summa cum laude)
- 2009 B.S.E University of Pennsylvania, Electrical Engineering (summa cum laude)

## Academic honors and grants

- 2018 PIC Math Fellowship, Mathematical Association of America
- 2018 Regional Inquiry Based Learning Grant, Mathematics Learning by Inquiry (\$2,000)
- 2017 Special Event Grant, College of Arts and Sciences, Ferris State University
- 2017 Timme Travel Grant, Faculty Center for Teaching and Learning, Ferris State University
- 2017 Student Research Fellowship (2), Ferris State University (\$12,000)
- 2016 Diversity Mini-Grant, Diversity and Inclusion Office, Ferris State University
- 2016 Faculty Travel Grant, College of Arts and Sciences, Ferris State University
- 2016 Undergraduate Research Grant, College of Arts and Sciences, Ferris State University
- 2016 Junior Faculty Fellowship, Ferris State University
- 2016 Speaker Grant, Office of Research & Sponsored Programs, Ferris State University
- 2016 Special Event Grant, College of Arts and Sciences, Ferris State University
- 2015 Timme Travel Grant, Faculty Center for Teaching and Learning, Ferris State University
- 2015 Project NExT Fellowship, Mathematical Association of America, 2015-2016
- 2014 Preparing Future Faculty Fellowship, Duke University
- 2014 Dean's Award for Excellence in Teaching, Duke University
- 2014 Graduate Student Travel Grant, Duke University
- 2014 Conference Travel Award, Duke University
- 2010 – 2014 NSF Graduate Research Fellowship
- 2010 – 2014 Graduate Fellowship, Duke University (declined 2010-2013)
- 2009 Phi Beta Kappa (awarded by University of Pennsylvania chapter)
- 2009 Senior Design Competition – First Prize, University of Pennsylvania
- 2009 A. Atwater Kent Prize, University of Pennsylvania
- 2008 E. Stuart Eichert, Jr. Memorial Prize, University of Pennsylvania

## Research interests

My research is in applied mathematics with a focus on problems in music theory. Undergraduate research collaboration is integral to many of my projects, with topics ranging from number theory to signal processing. As a PIC Math fellow, I am experienced in mentoring undergraduates in applied mathematics problems for clients in industry.

## At Ferris

- 2018 Fall Mathematical Statistics 1
- 2018 Fall Applied Calculus (Math 216)
- 2018 Fall Quantitative Reasoning for Professionals I (Math 109)
- 2018 Spring Seminar on Inquiry-Based Learning (Math 590)

- 2018 Spring Linear Algebra (Math 322)
- 2018 Spring Advanced Algebra-Analytic Trig (Math 126)
- 2018 Spring Quantitative Reasoning for Professionals II (Math 114)
- 2017 Fall Applied Calculus (Math 216)
- 2017 Fall Advanced Algebra-Analytic Trig (Math 126)
- 2017 Fall Quantitative Reasoning for Professionals I (Math 109)
- 2017 Spring Advanced Calculus-Real Analysis (Math 430)
- 2017 Spring Quantitative Reasoning for Professionals II (Math 114)
- 2016 Fall Applied Calculus (Math 216)
- 2016 Fall Adv Algebra-Analytical Trig (Math 130)
- 2016 Fall Quantitative Reasoning for Professionals I (Math 109)
- 2016 Spring Linear Algebra (Math 322)
- 2016 Spring Calculus 1 (Math 220)
- 2016 Spring Intermediate Algebra-Numerical Trig. (Math 116)
- 2015 Fall Calculus 2 (Math 230)
- 2015 Fall Intermediate Algebra-Numerical Trig. (Math 116)

#### At Duke

- 2015 Spring Laboratory Calculus and Functions I (Math 105L)
- 2014 Fall Laboratory Calculus and Functions I (Math 105L)
- 2013 Spring Laboratory Calculus and Functions I (Math 105L)
- 2012 Fall Introductory Calculus II with Applications (Math 122L)
- 2012 Spring Laboratory Calculus II (Math 112L)
- 2011 Fall Laboratory Calculus and Functions I (Math 105L)
- 2009 Fall Teaching assistant for Laboratory Calculus and Functions I (Math 105L)

#### Scholarly Articles/Texts

- 2017 2. A. Bannerman, J. Emington, A. Venkatesh. *Optimal Tuning of Multi-Rank Keyboards*, (under review). [arXiv:1711.05260]. <https://arxiv.org/abs/1711.05260>.
- 2016 1. V. Piercey, A. Venkatesh, E. Militzer. *Quantitative Reasoning for Professionals*, open-access textbook, 2016.

#### Lectures and presentations

##### Invited talks

- 2019 Mar. Albion, MI (Albion College): Symmetric Substructures in Musical 12-Tone Rows
- 2018 Sep. Elon, NC (Elon University): Miraculous Tunings of Multi-Rank Keyboards
- Sep. High Point, NC (High Point University): Miraculous Tunings of Multi-Rank Keyboards
- 2017 Nov. Grand Rapids, MI (Calvin College): Optimal Tuning of Two-Dimensional Keyboards
- Nov. Big Rapids, MI (Political Engagement Project): Mathematics and Gerrymandering
- Oct. Grand Rapids, MI (Endless Opportunities Mentoring): Credit Cards and Financial Literacy
- Oct. Big Rapids, MI (Ferris Board of Trustees): Interdisciplinary Math-English Project
- Sep. Big Rapids, MI (New Faculty Transition Program): Learner-Centered Teaching Workshop
- Aug. Big Rapids, MI (Ferris State University Seminar Orientation): Fostering Inclusive Classrooms
- Aug. Big Rapids, MI (TIP Scholars Program): Getting Ready for College Math
- Jun. Allendale, MI (Grand Valley State University): A Categorization of Miracle Temperaments
- Feb. Big Rapids, MI (The Science Squad Nonprofit) Introduction to the Theory of Temperaments
- 2016 Apr. Kalamazoo, MI (K'zoo College): Pythagoras to Secor: Improving the Miracle Temperament
- 2015 Nov. Holland, MI (Hope College): Generating Functions and Recurrence Relations

- Oct. Allendale, MI (Grand Valley State University): Generating Functions and Rec. Relations
- Mar. Washington, DC (AMS sectional meeting): Iterated Integrals of Eisenstein Series  
AMS Special Session on Iterated Integrals and Applications
- Jan. Big Rapids, MI (Ferris State University): Generating Functions and Divisor Fcn. Relations
- 2014 Nov. Elon, NC (Elon University): Cardinality and Gödel Numbering
- Oct. Elon, NC (Elon University): Orders of Infinity

#### Conference abstracts

- 2018 Aug. Denver, CO (MAA MathFest)  
Mastery Grading For The Masses: A Public Reflection  
TCPS: Mastery Grading
- Jan. San Diego, CA (JMM)  
Symmetric Substructures in Musical 12-Tone Rows  
MAA Contributed Paper Session on Arts and Mathematics, The Interface
- 2017 Jul. Chicago, IL (MAA MathFest)  
Partitions by Harmonic Means and the Damage-Per-Second Indicator  
TCPS: Mathematics in Video Games
- Mar. Big Rapids, MI (Michigan MAA)  
Mastery-Based Assessment with Reflective Writing
- Jan. Atlanta, GA (JMM)  
Pythagoras to Secor: Improving the Miracle Temperament  
MAA Contributed Paper Session on Mathematics and the Arts
- 2016 Oct. University Center, MI (MichMATYC)  
The Unexpected Partnership Between Math and English: A Public Reflection
- Aug. Columbus, OH (MAA MathFest)  
Mastery-Based Assessment: An Implementation with Reflective Writing  
TCPS: Formative Assessment Techniques for Undergraduate Math Courses
- Jan. Seattle, WA (JMM)  
Pythagoras to Secor: A mathematical approach to musical temperament  
MAA Contributed Paper Session on Math and the Arts
- 2015 Aug. Washington, DC (MAA MathFest)  
Pythagoras to Secor: Generalized keyboards and the miracle temperament  
TCPS: Mathematics and Art
- Jan. San Antonio, TX (JMM)  
Massey Products of Eisenstein Series  
AMS General Contributed Paper Session on Number Theory

#### Other talks

- 2014 Oct. Math Slam (Duke Math Department): Generating Functions and the Fibonacci Sequence
- Sep. Duke Mathematics Graduate-Faculty Seminar: The Arithmetic of Modular Forms
- 2009 Sep. Duke Mathematics Elliptic Curves Seminar: A Concrete Approach to Elliptic Integrals

#### Sessions/panels organized

- 2019 Jan. Baltimore, MD (JMM): Mathematics and the Arts  
MAA Themed Contributed Paper Session
- 2018 Feb. West Michigan Lecture Series in Mathematics  
Joint with West Michigan Lecture Series Consortium  
Speaker: Carol Schumacher (Kenyon College)

- 2017 Jul. Chicago, IL (MathFest): Writing Across the Curriculum in Mathematics  
MAA Contributed Paper Session
- Mar. West Michigan Lecture Series in Mathematics  
Collaboration with Calvin College, Hope College, and Grand Valley State University  
Speaker: Dave Kung (St. Mary's College of Maryland, MAA)
- 2016 Oct. West Michigan Lecture Series in Mathematics  
Collaboration with Grand Valley State University, Kalamazoo College, and Calvin College  
Speaker: Michael Dorff (BYU, CURM)
- Aug. Columbus, OH (MathFest): Specifications-Based Grading  
Project NExT Invited Paper Session  
Panelists: Clark, D., Owens, K.
- Jan. Seattle, WA (JMM): Integrating Writing in Undergraduate Courses  
Project NExT Invited Paper Session  
Panelists: Crannell, A., Leonard, K., Pilgrim, M.

### Undergraduate Research Mentored

- 2018 Feb. B. Doyle, A. Rao: *Symmetric Substructures of Twelve-Tone Rows*. Independent research project on mathematical music theory.
- 2017 Jul. B. Doyle, A. Eastwood, P. Renne: *The Luckiest Abelian Group: Investigating the Error Term in Cohen-Lenstra Heuristics*. Independent research project on computational number theory. Internal and external funding obtained. Presented at MAA MathFest Student Paper Session.
- May J. Ford and L. McReynolds: *Strategies for Smokestack: A Statistical Analysis of Card Game Algorithms*. Independent research project studying various computer strategies for the card game *Smokestack*. Presented at Michigan MAA Sectional Meeting.
- 2016 Dec. A. Gullickson and M. Waterstradt: *Strategies for Smokestack*. Independent research project creating computer strategies for the card game *Smokestack*.
- Aug. A. Bannerman and J. Emington: *Improving the Miracle Temperament*. Independent research project on mathematical music theory. Internal and external funding obtained. Presented at MathFest Pi Mu Epsilon Student Paper Session.
- Apr. J. Meehan: *In the Shadow of the Bat*. Independent research project applying Fourier optics to the Bat Signal.

### Conferences Refereed

- 2018 Aug. Pi Mu Epsilon Student Paper Sessions, Denver, CO
- Jan. Joint Mathematics Meetings Undergraduate Poster Session, San Diego, CA
- 2017 Aug. MathFest MAA Student Paper Session, Chicago, IL
- Apr. Posters on the Hill (Council on Undergraduate Research), Washington, D.C.
- Jan. Joint Mathematics Meetings Undergraduate Poster Session, Atlanta, GA
- 2016 Aug. MathFest MAA Student Paper Session, Columbus, OH
- Jan. Joint Mathematics Meetings Undergraduate Poster Session, Seattle, WA
- 2015 Sept. SACNAS National Conference Undergraduate Abstract Submissions, Washington, D.C.

### Books Reviewed

- 2016 Nov. MAA Reviews: *The Geometry of Celestial Mechanics*.

### Conferences/workshops attended

- 2018 Aug. MAA MathFest, Denver, CO
- Mar. MAA Trisection Meeting, Valparaiso, IN
- Jan. Joint Meetings in Mathematics, San Diego, CA

- 2017 Jul. MAA MathFest, Chicago, IL  
 — Jul. MathFest Minicourse on Mastery-Based Grading, Chicago, IL  
 — Jun. Inclusivity and Inclusive Classrooms Institute, Big Rapids, MI  
 — May The POGIL Project Workshop, Grand Rapids, MI  
 — Mar. Michigan MAA, Big Rapids, MI  
 — Feb. Facilitator Training, Museum of Sexist Objects, Big Rapids, MI  
 — Jan. Joint Meetings in Mathematics, Atlanta, GA  
 2016 Oct. MichMATYC, University Center, MI  
 — Aug. MAA MathFest, Columbus, OH  
 — Aug. IBL Colloquium 2015, Columbus, OH  
 — Apr. MAA Michigan Section Meeting, Hillsdale, MI  
 — Mar. Reacting to the Past Workshop, Eastern Michigan University, Ypsilanti, MI  
 — Jan. Joint Meetings in Mathematics, Seattle, WA  
 2015 Aug. MAA MathFest, Washington, DC  
 — Aug. Project NExT Workshop, Washington, DC  
 — Mar. AMS Special Session, Washington, DC  
 — Jan. Joint Meetings in Mathematics, San Antonio, TX  
 2014 Nov. AMS Special Session, Greensboro, NC  
 — Oct. Workshop on the Fundamental Group and Periods, Princeton, NJ (IAS)  
 — Aug. Teaching and Learning Conference, Elon, NC  
 — Jul. Periods and Motives: Feynman Amplitudes in the 21st Century, Instituto de Ciencias Matemáticas  
 2013 Jun. Recent Advances in Hodge Theory, University of British Columbia  
 2011 Jun. Multiple Zeta Values, Modular Forms & Elliptic Motives, University of Bristol  
 2010 Jun. Sage Days 22, Berkeley, CA (MSRI)

### Academic Service

#### Extramural Service

- 2018 Faculty Mentor – Great Talks MathFest 2018  
 2017 – Volunteer – Endless Opportunities mentoring (Grand Rapids, MI)  
 2016 – MAA Book Reviewer  
 2016 – 2017 Coordinator – Michigan Undergraduate Mathematics Conference  
 2016 – PRIMUS referee  
 2016 – Pi Mu Epsilon Journal referee

#### Service at Ferris

- 2017 – 2020 Faculty/Staff Diversity Mini-Grant Committee  
 2017 – Department Assessment Committee  
 2017 – Facilitator – Ferris Museum of Sexist Objects  
 2016 – Faculty Advisor (Pre-Pharmacy)  
 2016 Aug. Faculty Panelist – New Faculty Orientation Week  
 2016 Apr. Faculty representative – Lower Michigan Mathematics Competition (Holland, MI)  
 2016 Feb. *Ferris In Focus* Math Department Panelist – digital media production senior project  
 2016 – Super STEM Saturday Committee – math experience for local middle school students  
 2015 – 2017 MAA Michigan Section Meeting Planning Committee  
 2016 – 2018 Chair – University Diversity Committee  
 2016 – Faculty Advisor – Ferris Chess Club  
 2015 – 2016 University Diversity Committee  
 2015 – 2017 Academic Interdisciplinary Task Force

- 2015 – Service Departmental Division
- 2015 – Core Departmental Division
- 2015 – Department Scheduling Committee
- 2015 Nov. Faculty Mentor – Chinese Faculty Mentor Program
- 2015 Sep. Faculty representative – Accident Fund information session (Lansing, MI)

#### Service at Duke

- 2014 Dec. Selection Committee – Dean’s Award for Excellence in Teaching
- 2014 Aug. Graduate Student Panelist – new student orientation for Duke Graduate School
- 2010 – 2014 Graduate Student Panelist (departmental recruitment events)
- 2010 – 2011 Graduate Student Departmental Representative
- 2010 – 2011 Volunteer – Emily K. Center tutoring local high school students

#### Service at Penn

- 2008 – 2009 Volunteer teaching assistant in 11<sup>th</sup>-grade physics at University City High School (Philadelphia, PA)
- 2006 – 2008 Campus coordinator – *Think Outside the Bottle* campaign to oppose public spending on bottled water.

#### Professional Affiliations

AMS, MAA, Pi Mu Epsilon, Council on Undergraduate Research

#### Engineering research/design experience

- 2012 – Developer and content team manager for Star Sonata LLC. Platform: C++ and XML.
- 2009 Apr. Senior Design Project. Designed and built a 21-camera array, wrote a custom video streaming protocol above UDP, and wrote a software package to perform real-time facial recognition of occluded persons. Platform: C++.
- 2008 Aug. Research fellow at SUNFEST REU at University of Pennsylvania. Wrote code to implement software package for voice-guided pathfinding robot. Platform: Java and Python.
- 2007 Jul. Research assistant at Signal Processing Lab at Helsinki University of Technology. Designed and studied various implementations of Newton’s method for optimization on manifold of  $n \times n$  unitary matrices. Platform: Matlab.

#### Relevant Computer Skills

L<sup>A</sup>T<sub>E</sub>X, Maple, Mathematica, Sage, Python, Matlab, C++, Excel, Google Docs Suite

**References**

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