

FELICE | MANGANIELLO



TOP | ACHIEVEMENTS

»» Impactful Research

- Member of the original international team of **CROSS**, a candidate in the National Institute of Standards and Technology (NIST) "Post-Quantum Cryptography: Digital Signature Schemes" standardization process.
- My research on **subspace codes** has gained increasing impact over the last decade. A proposed conjecture sparked thriving research across coding theory and finite geometries, and was conclusively proven in 2018.
- A recent research focus on **multiparty and distributed computation** is gaining significant attention, driven by a collaborative paper with two CECAS departments published in 2021 on improved solvers for linear equations.

»» Awards and Recognition for Excellence.

- Contributed to securing **\$2,538,969** and **CHF 391,652** in external research funding:
 - Co-PI (2016-2018) and PI (2018-2023) on a multi-million-dollar **NSF RTG Grant**.
 - Co-PI since 2019 on a **NSF standard grant** with a faculty member of the ECE Department.
- I have delivered approximately 55 research presentations, including **3 colloquium talks** and **16 seminar presentations at universities with very high research activity (Carnegie R1) or international institutions**. Notable examples include the University of Toronto, University of Nebraska-Lincoln, University of Illinois at Urbana-Champaign, Eindhoven University of Technology, and Virginia Tech.
- Recipient of a **2019 Simons Visiting Professor** award from the Mathematisches Forschungsinstitut Oberwolfach (MFO).
- Since 2021, **Senior Member** of IEEE.
- **Associate Editor**, IEEE Transactions on Information Theory, Impact Factor: 2.5, CiteScore: 5.8 (2023–present), the flagship journal of the IEEE Information Theory Society (IT-Soc).
- **Program Committee Member** of two international annual conferences: the *Workshop on Code-Based Cryptography (CBCrypto)*, the most significant workshop in code-based cryptography, and the *IEEE International Symposium on Information Theory (ISIT)*, the flagship conference of the IEEE ITSoc.
- **NSF Panelist**, 2020, 2021, and 2024
- **Tenure and Promotion External Reviewer** for the University of South Florida, the United States Military Academy, and Florida Atlantic University.

»» Mentoring and Advising Success

- Supervised research for over **30 undergraduate students** through Research Experiences for Undergraduates (REUs) and Creative Inquiries (CIs). Two of these students received the prestigious **Barry Goldwater Scholarship**, and roughly half pursued **graduate studies at R1 universities**.
- Successfully advised **1 Ph.D. student**, who was first employed as a Cryptographer at a blockchain company, and **8 M.S. students**. Currently advising 3 Ph.D. students and co-advising 1 M.S. student.
- Successfully mentored **4 Postdoctoral Research Fellows**:
 - 2 hold tenure-track Assistant Professorships at R1 universities (Virginia Tech and Clemson University).
 - 1 holds an Assistant Teaching Professor position at William & Mary University.
 - 1 is the Data Analytics Manager for a healthcare company.

»» Leadership Accomplishments

- **RTG Grant Manager**: As Co-PI (2016-2018) and PI (2018-2023), managed a team that achieved:
 - Multi-year financial research support for **4 postdocs** and **14 graduate students**.
 - REU support for **144 undergraduate students**.
 - Publication of over **50 peer-reviewed journal articles and proceedings**.
 - Over **140 presentations** at conferences or universities.
 - Approval of **1 patent** and submission of a digital signature to a **NIST competition**.
- **Associate Director** (Division Lead) for Mathematical and Statistical Education:
 - Directed hiring searches for **9 Lecturers** and **2 Senior Lecturers**.
 - Facilitated the nomination of College and University awards for supervisees. While in this position, 2 faculty members received the **Dean's Distinguished Lecturer Award**, one received the **Dr. Ted G. Westmoreland Award for Faculty Excellence**, and one received the **Ralph D. Elliott Award for Outstanding Service to Off-Campus, Distance and Continuing Education**.
 - Organized a Faculty Learning Community (FLC) on Peer Observation of Teaching (POT) Training in collaboration with OTEI, with **21 SMSS faculty members** participating.

Contact information

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Positions held

since **Associate Professor**, School of Mathematical and Statistical Sciences, Clemson University, USA
Aug 2019

since **Affiliated Faculty**, *Cybersecurity Research Lab*, Ted Rogers School of Management, Toronto Metropolitan University, Canada
Aug 2020

Aug 2019 - **Visiting Scientist**, *Cybersecurity Research Lab*, Ted Rogers School of Management, Toronto Metropolitan University, Canada
Aug 2020

Oct 2013 - **Assistant Professor**, School of Mathematical and Statistical Sciences, Clemson University, USA
Aug 2019

Sep 2011 - **Postdoctoral Fellow**, Department of Electrical and Computer Engineering, University of Toronto, Canada
Aug 2013

Jan 2006 - **Graduate/Teaching Assistant**, *Institute of Mathematics*, University of Zurich, Switzerland
May 2011

Administrative Position

since **Associate Director for Mathematics and Statistics Education**, School of Mathematical and Statistical Sciences, Clemson University, USA
Jan 2022

Education

Oct 2011 **Ph.D. in Mathematics**, *University of Zurich*, Switzerland, Defense title: Spread Codes and more General Network Codes
Advisor: Prof. J. Rosenthal

Oct 2005 **M.S. (Laurea) in Mathematics**, *University of Pisa*, Italy, Defense title: Calcolo della distribuzione dei pesi nei codici ciclici accorciati
Advisor: Prof. P. Gianni – Co-advisor: Prof. C. Traverso

Research areas of interest

Coding theory (classical and quantum), Cryptography, Post-Quantum Cryptography, Distributed Storage, Secure Multiparty Computations, Parallel Computing.

Memberships of professional societies

IEEE, Senior Member, (since 2021) **AMS**, Member **SIAM**, Member

Accolades

Mar 2019 **2019 Simons Visiting Professor - MFO**

Awards and grants

At Clemson University

May 2023 - **DECAL: Data sECurity and mAchine Learning**, Faculty Excellence Interdisciplinary Enhancement
Mar 2024 Program, College of Science, Clemson University, \$19,075

- Aug 2019 - **Encrypted Control for Privacy-Preserving and Secure Cyber-Physical Systems**, *Co-PI*, NSF Grant
 Jul 2024 ECCS-1912702, \$380,000 (\$38,000)
 Yongqiang Wang (PI), ECE Department, Clemson University
- Aug 2016 - **RTG: Coding Theory, Cryptography, and Number Theory**, *PI*, NSF Grant DMS-1547399, \$2,126,971
 Jul 2023 (\$425,394)
 Jim Brown (former PI), Shuhong Gao (Co-PI), Kevin James (Co-PI), Gretchen Matthews (former Co-PI)
- 2018 **Science Online Development Grant**, College of Science, Clemson University, \$7,500
- 2016 **Shannon Centennial Event at Clemson University**, *IEEE, Information Theory Society*, \$2,650
Before Clemson University
- Sep 2012 - **Codes, Algorithms And Cryptography For Random Linear Network Coding**, *PI*, Swiss NSF Grant
 Feb 2013 138738, Fellowships for prospective researchers, 21,650 CHF
- Sep 2011 - **Codes, Algorithms And Cryptography For Random Linear Network Coding**, *PI*, Swiss NSF Grant
 Aug 2012 135934, Fellowships for prospective researchers, 47,370 CHF
- Sep 2009 - **Algebraic Constructions of Network Codes**, *co-PI (employee)*, Swiss NSF Grant 126948, 116,264 CHF
 Sep 2011 PI Joachim Rosenthal
- Sep 2006 - **Algebraic Constructions of Codes on Graphs**, *co-PI (employee)*, Swiss NSF Grant 113251, 206,368
 Sep 2009 CHF
 PI Joachim Rosenthal

Publications

- [1] Emma Andrade, Jessalyn Bolkema, Thomas Dexter, Harrison Eggers, Tori Lynn, and Felice Manganiello. CSS-T code with non-vanishing rates from reed-muller codes. arXiv preprint arXiv:2305.06423, submitted to "Finite Fields and Their Applications".
- [2] Travis Alan Baumbaugh and Felice Manganiello. Recursive edge toggling for construction of de bruijn sequences. submitted to "SIAM journal on Discrete Mathematics".
- [3] F. R. Kschischang, F. Manganiello, A. Ravagnani, and K. Savary. External codes for multiple unicast networks via interference alignment. *Designs, Codes and Cryptography*, 2024.
- [4] Felice Manganiello and Freeman Slaughter. Generic error SDP and generic error CVE. In Andre Esser and Paolo Santini, editors, *Code-Based Cryptography*, pages 125–143, Cham, 2023. Springer Nature Switzerland.
- [5] Roberto Assis Machado and Felice Manganiello. Root of unity for secure distributed matrix multiplication: Grid partition case. In *2022 IEEE Information Theory Workshop (ITW)*, pages 155–159, 2022.
- [6] Travis Alan Baumbaugh, Haley Colgate, Tim Jackman, and Felice Manganiello. Batch codes from affine cartesian codes and quotient spaces. In Maura B. Paterson, editor, *Cryptography and Coding*, pages 3–15. Springer, 2021.
- [7] A. Ahmadi, F. Manganiello, A. Khademi, and M. C. Smith. A parallel jacobi-embedded gauss-seidel method. *IEEE Transactions on Parallel and Distributed Systems*, 32(6):1452–1464, 2021.
- [8] Jim Brown, Beren Gunsolus, Jeremy Lilly, and Felice Manganiello. Hilbert modular forms and codes over \mathbb{F}_{p^2} . *Finite Fields and Their Applications*, 67:101731, 2020.
- [9] Angelina Grosso, Felice Manganiello, Shiwani Varal, and Emily Zhu. Multicast triangular semilattice network. *Involve*, 12(8):1307–1328, 2019.
- [10] Travis Baumbaugh and Felice Manganiello. Matroidal root structure of skew polynomials over finite fields. *Journal of Discrete Mathematical Sciences and Cryptography*, 22(3):377–389, 2019.
- [11] Hiram H. López, Felice Manganiello, and Gretchen L. Matthews. Affine cartesian codes with complementary duals. *Finite Fields and Their Applications*, 57:13 – 28, 2019.

- [12] Yariana Diaz, Travis Baumbaugh, Sophia Friesenhahn, Felice Manganiello, and Alexander Vetter. Batch codes from Hamming and Reed-Muller codes. *Journal of Algebra Combinatorics Discrete Structures and Applications*, 5:153 – 165, 2018.
- [13] Sarah E. Anderson, Wael Halbawi, Nathan Kaplan, Hiram H. López, Felice Manganiello, Emina Soljanin, and Judy L. Walker. Representations of the multicast network problem. In Everett W. Howe, Kristin E. Lauter, and Judy L. Walker, editors, *Algebraic Geometry for Coding Theory and Cryptography*, pages 1–23. Springer International Publishing, 2017.
- [14] Shuhong Gao, Fiona Knoll, Felice Manganiello, and Gretchen Matthews. Codes for distributed storage from 3-regular graphs. *Discrete Applied Mathematics*, 229:82 – 89, 2017.
- [15] Siyu Liu, Felice Manganiello, and Frank R. Kschischang. Matroidal structure of skew polynomial rings with application to network coding. *Finite Fields and Their Applications*, 46:326 – 346, 2017.
- [16] Siyu Liu, Felice Manganiello, and Frank R. Kschischang. Construction and decoding of generalized skew-evaluation codes. In *14th Canadian Workshop on Information Theory (CWIT14)*, 2015. 2nd ranked as "Best student paper award".
- [17] Felice Manganiello and Anna-Lena Trautmann. Spread decoding in extension fields. *Finite Fields and Their Applications*, 25(0):94 – 105, 2014.
- [18] Anna-Lena Trautmann, Felice Manganiello, Michael Braun, and Joachim Rosenthal. Cyclic orbit codes. *Information Theory, IEEE Transactions on*, 59(11):7386–7404, 2013.
- [19] Siyu Liu, Felice Manganiello, and Frank R. Kschischang. Kötter interpolation in skew polynomial rings. *Designs, Codes and Cryptography*, pages 1–16, 2013.
- [20] Elisa Gorla, Felice Manganiello, and Joachim Rosenthal. An algebraic decoding approach for spread codes. *Adv. Math. Commun.*, 6(4):442–466, 2012.
- [21] Felice Manganiello, Anna-Lena Trautmann, and Joachim Rosenthal. On conjugacy classes of subgroups of the general linear group and cyclic orbit codes. In *Proceedings of the 2011 IEEE International Symposium on Information Theory*, Saint Petersburg, Russia, 2011.
- [22] Anna-Lena Trautmann, Felice Manganiello, and Joachim Rosenthal. Orbit codes – a new concept in the area of network coding. In *Proceedings of the 2010 IEEE Information Theory Workshop*, Dublin, Ireland, 2010.
- [23] Felice Manganiello, Elisa Gorla, and Joachim Rosenthal. Spread codes and spread decoding in network coding. In *Proceedings of the 2008 IEEE International Symposium on Information Theory*, pages 851–855, Toronto, Canada, 2008.
- [24] Felice Manganiello. Computation of the weight distribution of CRC codes. *Applicable Algebra in Engineering, Communication and Computing*, 19(4):349–363, August 2008.

Other products

- Jun 2023 **CROSS - Codes and Restricted Objects Signature Scheme**, *National Institute for Standard and Technology (NIST)*, Post-Quantum Cryptography: Digital Signature Schemes, Submission for a Standardization competition. <https://www.cross-crypto.com>
(joint effort with the Technical University of Munich (Germany), the Polytechnic University of Marche (Italy), and the Polytechnic University of Milan (Italy))

Talks

Invited

- Dec 2023 **Generic Error SDP and Generic Error CVE**, *University of Neuchâtel*, Neuchâtel, Switzerland
- Apr 2023 **Code-based Cryptography: The Future of Security Against Quantum Threats**, *Plenary Speaker*, MAA Social-Nevada Sectional Meeting, University of La Verne, La Verne, California
- Jul 2022 **An Attack on Generalized-error CVE ZK-ID Schemes**, *Virginia Tech*, Blacksburg, Virginia

- Nov 2022 **CSS-T Codes from Reed-Muller Codes For Quantum Fault-Tolerance**, *Zurich University*, Zurich, Switzerland
- Oct 2021 **CSS-T Codes from Reed-Muller Codes For Quantum Fault-Tolerance**, *Baylor University*, Waco, Texas
- Jan 2021 **Limits of Reed-Muller Codes for Quantum Fault-Tolerance, I and II**, *Virginia Tech*, Blacksburg, Virginia
- Nov 2020 **Graphs and Algebra in Modern Communication**, *Graphs@TUM*, *Toronto Metropolitan University*, Toronto, Canada
- May 2020 **Graphs and Finite Fields in Modern Communication**, *Carleton Finite Fields eSeminar*, *Carleton University*, Ottawa, Canada
- Feb 2020 **Interference Alignment over Finite Fields**, *Digital Communication Group seminar - University of Toronto*, Toronto, Canada
- Nov 2019 **Reed-Muller codes with application to quantum computation and information retrieval**, *Colloquium*, *Cleveland State University*, Cleveland, OH, USA
- May 2019 **Algebraic aspects of Network Communication and Other Problems in Coding Theory**, *Eindhoven University of Technology*, Eindhoven, Netherlands
- Mar 2019 **Batch Codes from Evaluation Codes**, *University of St. Gallen*, St. Gallen, Switzerland
- May 2017 **Representations of the Multicast Network Problem**, *Seminar in coding theory and cryptography - University of Neuchâtel*, Neuchâtel, Switzerland
- Sep 2016 **On Multicast networks and Grassmannians**, *College of Charleston*, Charleston, SC, USA
- Sep 2016 **Communication over networks from an algebraic point of view**, *Colloquium*, *College of Charleston*, Charleston, SC, USA
- Nov 2015 **Theory and applications of skew polynomial rings**, *The First Colombian Workshop on Coding Theory (CWC 2015)*, *Universidad del Norte*, Barranquilla Colombia
- Jun 2015 **Theory and Applications of skew polynomial rings**, *Seminar in coding theory and cryptography - University of Zürich*, Zürich, Switzerland
- Apr 2015 **On communication over networks via skew polynomials**, *Seminars on Information Theory - University of Toronto*, Toronto, ON, Canada
- Mar 2015 **On communication over networks via skew polynomials**, *Rocky Mountain Algebraic Combinatorics Seminar - Colorado State University*, Fort Collins, CO, USA
- Nov 2014 **On communication over networks via skew polynomials**, *Communications/ICWS Seminar - University of Illinois at Urbana-Champaign*, Urbana, IL, USA
- May 2014 **On Communication over Networks**, *Seminar in coding theory and cryptography*, Neuchâtel, Switzerland
- Apr 2012 **Constant dimension codes for linear random network coding**, *Discrete Math Seminar - University of Lincoln Nebraska*, Lincoln, NE, USA
- Apr 2010 **Spread codes: a complete decoding approach**, *Arbeitsgemeinschaft in Codierungstheorie und Kryptographie*, *University of Basel*, Switzerland
- Dec 2006 **What are ... Error Correcting Codes?**, *Graduate Colloquium*, *Zurich Graduate School in Mathematics*, Switzerland
- [Solicited \(regional, national and international meetings\)](#)
- Apr 2024 **External Codes for Multiple Unicast Networks via Interference Alignment**, *AMS Spring Sectional Meetings*, *Howard University*, Washington DC
- Apr 2024 **CROSS - Codes and Restricted Objects Signature Scheme**, *AMS Spring Sectional Meetings*, *Howard University*, Washington DC
- Jan 2024 **External Codes for Multiple Unicast Networks via Interference Alignment**, *2024 Joint Mathematics Meetings*, *San Francisco*, California
- Jan 2024 **CROSS - Codes and Restricted Objects Signature Scheme**, *2024 Joint Mathematics Meetings*, *San Francisco*, California
- Oct 2023 **Generic Error SDP and Generic Error CVE**, *SIAM TX-LA 2023*, *University of Louisiana at Lafayette*, Louisiana

- Jul 2023 **Freezing the Network Code: An Interference Alignment Problem over Finite Fields**, *SIAM Conference on Applied Algebraic Geometry (AG23)*, Eindhoven University of Technology, Netherlands
- Jan 2023 **Root of Unity for Secure Distributed Matrix Multiplication: Grid Partition Case**, *2023 Joint Mathematics Meetings*, Boston, Massachusetts
- Aug 2021 **Reed-Muller Codes As CSS- T Codes**, *SIAM Conference on Applied Algebraic Geometry (AG21)*, Virtual
- Jul 2021 **Interference Alignment in Multiple Unicast Networks over Finite Fields**, *Mathematical Congress of the Americas (MCA 2021)*, Virtual
- Jul 2019 **Batch properties of Affine Cartesian Codes**, *SIAM Conference on Applied Algebraic Geometry (AG19)*, Bern, Switzerland
- Aug 2017 **Codes for Distributed Storage from 3-regular Graphs**, *SIAM Conference on Applied Algebraic Geometry (AG17)*, Atlanta, GA, USA
- Jul 2017 **Representations of the Multicast Network Problem**, *Mathematical Congress of the Americas (MCA 2017)*, Montréal, QC, Canada
- Oct 2016 **Distributed storage systems from regular graphs**, *AMS Fall Central Sectional Meeting*, Minneapolis, MN, USA
- Oct 2015 **Theory and Applications of skew polynomial rings**, *AMS Central Fall Sectional Meeting - Loyola University*, Chicago, IL, USA
- Aug 2015 **On communication over networks via skew polynomials**, *SIAM Conference on Applied Algebraic Geometry (AG15) - CAMP*, Daerjeon, South Korea
- Oct 2013 **Kötter interpolation in skew polynomial rings.**, *AMS Fall Southeastern Section Meeting*, University of Louisville, Louisville, KY, USA
- Jan 2009 **On constructions of codes for random linear network coding**, *AMS Joint Mathematics Meetings*, Washington, DC, USA
- Jul 2015 **Theory and Applications of Skew Polynomial Rings**, *Fields-Carleton Finite Fields Workshop*, Ottawa, ON, Canada
- Nov 2011 **Decoding cyclic orbit codes and the discrete logarithm problem**, *Dagstuhl Seminar on Coding Theory*, Schloss Dagstuhl – Leibniz–Zentrum für Informatik, Germany
- Jul 2010 **Orbit codes in network coding**, *S³CM: Soria summer school on computational mathematics – “Algebraic Geometric Modelling in Information Theory”*, Soria, Spain
- May 2007 **Grassmannians in Coding Theory**, *Arbeitsgemeinschaft in Codierungstheorie und Kryptographie*, University of Zurich, Switzerland

Contributed

- Apr 2018 **Batch Codes from Hamming and Reed-Muller Codes**, *Code-Based Crypto Workshop*, Davie, FL, USA
- Jul 2014 **Network Coding via Skew Polynomials**, *Applications of Computer Algebra (ACA) 2014 - Fordham University*, New York, NY, USA
- May 2014 **Spread Codes and Their Role in Communication**, *22nd Ontario Combinatorics Workshop - York University and Fields institute*, Toronto, ON, Canada
- Jul 2015 **On communication over networks via skew polynomials**, *The 12th International Conference on Finite Fields and Their Applications (Fq12) - Skidmore College*, Saratoga Spring, NY, USA
- Aug 2011 **On conjugacy classes of subgroups of the general linear group and cyclic orbit codes**, *IEEE International Symposium on Information Theory, ISIT 2011*, Saint Petersburg, Russia
- Sep 2010 **Orbit codes – A new concept in the area of network coding**, *IEEE Information Theory Workshop, ITW 2010*, Dublin, Ireland
- Jul 2008 **Spread codes and spread decoding in network coding**, *IEEE International Symposium on Information Theory, ISIT 2008*, Toronto, ON, Canada
- Mar 2008 **Spread codes and spread decoding in network coding**, *4th Workshop on Coding and Systems*, University of Alicante and University of Elche, Spain
- Dec 2006 **List Decoding of CRT Codes**, *Third Workshop on “Codes and System”*, University of Zurich, Switzerland

Nov 2005 **Computation of the Weight Distribution of CRC Codes**, *Workshop on Convolutional Codes and Systems Theory*, University of Würzburg, Germany

Editorial, Technical Program Committee and Reviewing Services

since 2023 **Associate Editor**, *IEEE Transactions on Information Theory*, Impact Factor: 2.5, CiteScore: 5.8

since 2023 **Program Committee member**, *Workshop on Code-Based Cryptography (CBCrypto)*, annual conference

since 2022 **Technical Program Committee member**, *IEEE International Symposium on Information Theory (ISIT)*, annual conference

2020 & 2021 **Panelist**, *National Science Foundation (NSF)*

2020-2021 **Reviewer**, (*journals and conferences*), "IEEE Transaction on Information Theory", "IEEE Transactions on Communications", "Designs, Codes and Cryptography", "Finite Fields and Their Applications", "Advances in Mathematics of Communications", "ISIT", "CBCrypto" etc.

Tenure and Promotion external reviewer

2022 **University of South Florida**

2022 **United States Military Academy**

2021 **Florida Atlantic University**

Workshops and conferences

Organized online

since Apr 2020 **ACCESS - Algebraic Coding and Cryptography on the East coast Seminar Series**, *Joint effort designed to highlight world-class research in coding theory, cryptography, and related areas and to encourage collaboration among its participants*, founder and organizer, homepage in collaboration with Virginia Tech, Florida Atlantic University, and University of South Florida

Organized

Feb 29, 2024 **3-day Research Workshop**, *DECAL: Data sECurity and mAchine Learning*, Clemson, USA (together with R. Cartor, H. Xue, E. Gallagher, D. Kunkel, H. Hu, X. Li)

Jan 19, 2024 **Face-2-Face with industry**, *DECAL: Data sECurity and mAchine Learning*, Clemson, USA (together with Y. Ouyang., R. D'Oliveira and E. Breazel)

Apr 25-30, 2022 **CMO-BIRS Workshop "Algebraic Methods in Coding Theory and Communication"**, *Casa Matemática Oaxaca-BIRS*, Oaxaca, Mexico (together with E. Gorla, M. Greferath and H. López)

Oct 10-11, 2020 **Sessions on "Coding Theory, Cryptography, and Number Theory"**, *AMS Fall Southeastern Virtual Sectional Meeting* (together with R. Cartor, S. Gao and K. James)

Jan 15-18, 2020 **Sessions on "Coding Theory and Applications"**, *AMS Joint Mathematics Meetings*, Denver, CO, USA (together with A. Beemer, I Blake and C. Kelley)

Jan 24-28, 2019 **RTG: 2019 Early Career Research Workshop in coding theory, cryptography, and number theory**, *Clemson University*, Clemson, SC, USA

Jan 10-13, 2019 **Sessions on "Coding Theory and Applications"**, *AMS Joint Mathematics Meetings*, Baltimore, MD, USA (together with H. López and G. Matthews)

Jul 31-Aug 4, 2017 **Minisymposia on "Coding theory"**, *SIAM Conference on Applied Algebraic Geometry (AG17)*, Atlanta, GA, USA

Mar 10-12, 2017 **Sessions on "Coding Theory, Cryptography, and Number Theory"**, *AMS Sectional Meetings*, Charleston, SC, USA (together with J. Brown, S. Gao, K. James and G. Matthews)

Dec 2, 2016 **Shannon Centennial Event at Clemson**, Clemson, SC, USA (together with G. Matthews and S. Gao)

- April 9, 2016 **Meeting on Algebraic Geometry for Applications (MAGA16)**, Clemson, SC, USA
(together with M. Burr and S. Poznanovikj)
- Aug 3-8, 2015 **Minisymposia on "Coding theory"**, *SIAM Conference on Applied Algebraic Geometry (AG15)*, Daejeon, South Korea
(together with A. Ravagnani)
- Jan 10-13, 2015 **Sessions on "Advances in coding theory"**, *AMS Joint Mathematics Meetings*, San Antonio, TX, USA
(together with G. Matthews and J. Walker)
- [Attended](#)
- Apr 6-7, 2012 **AMS Spring Eastern Sectional Meeting**, Washington DC, USA
- Jan 3-6, 2024 **AMS Joint Mathematics Meetings**, San Francisco, CA, USA
- Nov 3-5, 2023 **SIAM TX-LA 2023**, University of Louisiana at Lafayette, Lafayette, LA USA
- Jul 10-14, 2023 **SIAM Conference on Applied Algebraic Geometry (AG23)**, Eindhoven, Netherlands
- Apr 29, 2023 **MAA Socal-Nevada Spring Sectional Meeting**, *UNiversity of La Verne*, La Verne, CA, USA
- Apr 22-23, 2023 **CBCrypto 2023 International Workshop on Code-Based Cryptography**, Lyon, France
- Jan 4-7, 2023 **AMS Joint Mathematics Meetings**, Boston, MA, USA
- Nov 14-16, 2022 **ACTIV(T) - Algebraic Coding Theory at Virginia Tech**, *Virginia Tech*, Blacksburg, Virginia
- Jul 11-15, 2022 **Coding theory and cryptography**, *University of Zurich*, Zurich, Switzerland
- Apr 25-30, 2022 **CMO-BIRS Workshop "Algebraic Methods in Coding Theory and Communication"**
- Aug 16-20, 2021 **SIAM Conference on Applied Algebraic Geometry (AG21)**, Online
- Jun 7-9, 2021 **Third PQC Standardization Conference**, *NIST*, USA
- Jan 6-9, 2021 **AMS Joint Mathematics Meetings**, USA
- Jan 15-18, 2020 **AMS Joint Mathematics Meetings**, Denver, CO, USA
- Jul 9-13, 2019 **SIAM Conference on Applied Algebraic Geometry (AG19)**, Bern, Switzerland
- Mar 17-23, 2019 **Oberwolfach Workshop on Contemporary Coding Theory**, *Mathematisches Forschungsinstitut Oberwolfach (MFO)*, Oberwolfach, Germany
- Jan 10-13, 2019 **AMS Joint Mathematics Meetings**, Baltimore, MD, USA
- Dec 16-21, 2018 **Dagstuhl Seminar on Algebraic Coding Theory for Networks, Storage, and Security**, *Schloss Dagstuhl – Leibniz-Zentrum für Informatik*, Wadern, Germany
- Nov 12-16, 2018 **Workshop on "Nonlinear Algebra in Applications"**, *Institute for Computational and Experimental Research in Mathematics (ICERM)*, Providence, RI, USA
- Nov 1-2, 2018 **RTG PI Meeting**, Alexandria, VA, USA
- July 5-6, 2018 **PQCrypto - Code-Based Cryptography Workshop (CBC 2018)**, *Florida Atlantic University*, Fort Lauderdale, FL, USA
- Jul 24-28, 2017 **Mathematical Congress of the Americas (MCA 2017)**, *Montréal, QC*, Canada
- Oct 28-30, 2016 **AMS Fall Central Section Meeting**, *University of St. Thomas*, Minneapolis, MN, USA
- Aug 7-12, 2016 **Dagstuhl Seminar on Coding Theory in the Time of Big Data**, *Schloss Dagstuhl – Leibniz-Zentrum für Informatik*, Wadern, Germany

- Feb 22-26, 2016 **Algebraic Geometry for Coding Theory and Cryptography**, *Institute for Pure & Applied Mathematics (IPAM)*, Los Angeles, CA, USA
- Nov 23-27, 2015 **The First Colombian Workshop on Coding Theory (CWC)**, *Universidad del Norte*, Barranquilla, Colombia
- Jul 13-17, 2015 **The 12th International Conference on Finite Fields and Their Applications (Fq12)**, *Skidmore College*, Saratoga Spring, NY, USA
- Jul 8-11, 2015 **Fields-Carleton Finite Fields Workshop**, *Carleton University*, Ottawa, ON, Canada
- Jul 9-12, 2014 **Applications of Computer Algebra (ACA2014)**, *Fordham University*, New York, NY, USA
- May 16-17, 2014 **22nd Ontario Combinatorics Workshop**, *York University and Fields Institute*, Toronto, ON, Canada
- Oct 5-6, 2013 **AMS Fall Southeastern Section Meeting**, *University of Louisville*, Louisville, KY, USA
- Aug 25-30, 2013 **Dagstuhl Seminar on Coding Theory**, *Schloss Dagstuhl – Leibniz–Zentrum für Informatik*, Wadern, Germany
- June 18-21, 2013 **13th Canadian Workshop on Information Theory (CWIT)**, *University of Toronto*, Toronto, Canada
- Oct 28-Nov 2, 2012 **Trends in Coding Theory**, *Centro Stefano Franscini*, Ascona, Switzerland
- Jul 1-6, 2012 **IEEE International Symposium on Information Theory, ISIT 2012**, Cambridge, MA, USA
- Nov 13-18, 2011 **Dagstuhl Seminar on Coding Theory**, *Schloss Dagstuhl – Leibniz–Zentrum für Informatik*, Wadern, Germany
- Jul 31-Aug 5, 2011 **IEEE International Symposium on Information Theory, ISIT 2011**, Saint Petersburg, Russia
- Feb 21-25, 2011 **Solving polynomial equations**, *CIAM/KTH*, Stockholm, Sweden
- Aug 31–Sep 3, 2010 **IEEE Information Theory Workshop, ITW 2010**, Dublin, Ireland
- Jan 5-8, 2009 **AMS Joint Mathematics Meetings**, Washington, DC, USA
- Jul 6-11, 2008 **IEEE International Symposium on Information Theory, ISIT 2008**, Toronto, ON, Canada
- Dec 2-8, 2007 **Oberwolfach Workshop on “Coding Theory”**, *Mathematisches Forschungsinstitut Oberwolfach (MFO)*, Oberwolfach, Germany
- Oct 15-21, 2006 **Oberwolfach Seminar on “The Mathematics of Error-Correcting Codes”**, *Mathematisches Forschungsinstitut Oberwolfach (MFO)*, Oberwolfach, Germany
- May 1-6, 2006 **Gröbner Bases in Cryptography, Coding Theory, and Algebraic Combinatorics**, *Johann Radon Institute for Computational and Applied Mathematics (RICAM) and Research Institute for Symbolic Computation (RISC)*, Linz, Austria
- Mar 16/17, 2006 **10th Rhine Workshop on Computer Algebra (RWCA)**, *University of Basel*, Switzerland
- Jan 30-Feb 3, 2006 **Mathematical aspects of high performance codes: state of the art and open problems**, *Centro di Ricerca Matematica “Ennio De Giorgi”*, Pisa, Italy
- Nov 16/18, 2005 **Workshop on Convolutional Codes and System Theory**, *University of Würzburg*, Germany
- Dec 1, 2003 **Coding and Cryptography**, *Milan Research Center for Industrial and Applied Mathematics (MIRIAM)*, Milan, Italy

[Summer schools](#)

- Jul 12-16, 2010 **Algebraic geometric modelling in information theory**, *S³CM*, Soria, Spain
- Jun 18-22, 2007 **Coding Theory**, *Sophus Lie Conference Center*, Nordfjordeid, Norway

Mentoring, Supervising, and Advising

Early-Career Faculty Mentoring

- since Aug 2022 **Rafael D'Oliveira**, *Research Mentor*
- since Aug 2021 **Ryann Cartor**, *Research Mentor*

Postdoctoral fellows

- since Aug 2021 **Joseph Skelton**
Now Assistant Teaching Professor position at William & Mary University.
- Aug 2021 - Aug 2023 **Roberto Assis Machado**
Now Business Analytics Manager at HealthPoint (CHC)
- Aug 2019 - Aug 2021 **Ryann Cartor**
Now Assistant Professor at Clemson University.
- Aug 2016 - Dec 2018 **Hiram Lopez Valdez**
Now Assistant Professor at Virginia Tech.

Graduate students

- Evan Hall**, *Ph.D.*, expected graduation 2029
- Sitraka Randrianarivo**, *Ph.D.*, expected graduation 2027
- Freeman Slaughter**, *Ph.D.*, expected graduation 2026
- Luke Szramowski**, *Master*, expected graduation 2024

Past Ph.D. students

- May 2020 **Travis Baumbaugh**, *Ph.D.*, First employment: Cryptographer at ToposWare

Past Master students

- Dec 2023 **Sitraka Randrianarivo**, *Master*, continued with a Ph.D. under my supervision
- May 2023 **Trinity White**, *Master*
- Aug 2022 **Freeman Slaughter**, *Master*, continued with a Ph.D. under my supervision
- Dec 2020 **Harrison Eggers**, *Master*, First employment: Scientist at TAE Technologies, Inc
- May 2019 **Alexander Joyce**, *Master*, continued with a Ph.D. in Operations Research
- May 2019 **Kristen Savary**, *Master*, continued with a Ph.D. in Operations Research
- May 2016 **Travis Baumbaugh**, *Master*, continued with a Ph.D. under my supervision

External Examiner on Ph.D. Dissertations

External to Clemson University

- Hedongliang Liu**, *Technical University of Munich*, expected August 2024

- Dec 2022 **Aidan Murphy**, *Virginia Tech*
- Dec 2022 **Rutuja Kschirsagar**, *Virginia Tech*

At Clemson University

- Dec 2023 **Marvin Jones**, *Clemson University*
- Aug 2022 **Todd Fenstermacher**, *Clemson University*
- Aug 2020 **Benjamin Case**, *Clemson University*
- Aug 2017 **Fiona Knoll**, *Clemson University*

May 2016 **Michael Dowling**, *Clemson University*

May 2015 **Sarah Anderson**, *Clemson University*

REU (Research Experience for Undergraduates) mentorships and projects

Summer 2022 **Secure Distributed Matrix Multiplication**, Students: Samuel John Armstrong (*Buena Vista University*), Hisham Awartani (*Brown University*), Timothy Cheeck (*University of Michigan*), Theresa Sofia Pollard (*New York University*), Taylor Ruehl (*Occidental College*)

Summer 2021 **CSS-T codes from Reed-Muller codes**, Students: Andrade Emma (*California State University, Fresno*), Dexter Thomas (*Texas A&M University*) and Luongo Victoria (*Clemson University*)

Summer 2021 **Polar Codes from Higher Alphabets**, Students: Parson Madelyn (*University of Wisconsin-Madison*) and Skora Emmanuel (*Lewis & Clark College*)

Summer 2019 **Finite fields interference alignment of multiple unicast networks**, Students: Nathan Akerhielm (*Haverford University*), Paige Beidelman – (*University of Mary Washington*), Kimberly Hancock (*Bowdoin College*), Kaiwen Lu – (*University of Michigan*), Pedro Morales – (*Montgomery College*)

Summer 2018 **Constructing lattices from codes over \mathbb{F}_{p^2}** , Students: Beren Gunsolus (*University of Minnesota Twin Cities*) and Jeremy Lilly (*Oregon State University*)
co-mentorship with Jim Brown (*Occidental College*).

Summer 2018 **Batch codes from affine cartesian codes**, Students: Haley Colgate (*Colorado College*) and Timothy Jackman (*Northeastern University*)

Summer 2017 **Multicast triangular semilattice network.**, Students: Angelina Grosso (*University of Kentucky*), Shiwani Varal (*The College of Wooster*) and Emily Zhu (*Carnegie Mellon University*)

Summer 2017 **Optimal Batch Codes from Hamming and Reed-Muller codes.**, Students: Yariana Diaz (*Amherst College, Mathematics*), Friesenhahn Sophia (*Willamette University*) and Alexander Vetter (*Villanova University*)

Teaching experiences

Undergraduate Instructorships at Clemson University

Spring 2024 **MATH2190 - Introduction to Mathematical Cryptography**, (as well Spring 17, Spring 19, Spring 22, Spring 23)

Fall 2021 **Online - MATH1060 - Calculus of One Variable I**

Fall 2020 **Hybrid - MATH1060 - Calculus of One Variable I**

Summer 2020 **Online - MATH3110 - Linear Algebra - Online**, (as well in Summer 2019)

Fall 2018 **MATH3110 - Linear Algebra**, (as well Fall 14, Spring 14, Fall 15, Fall 16 and Fall 17)

Graduate Instructorships at Clemson University

Spring 2021 **Online - MATH9740 - Privacy-aware Artificial Intelligence**

Spring 2021 **Online - MATH8570 - Cryptography**

Spring 2018 **MATH8560 - Information Theory and Coding Theory**, (as well in Spring 14, Spring 16)

Fall 2015 **MATH8530 - Matrix Analysis**

Spring 2015 **MATH8570 - Cryptography**

Fall 2014 **MATH8510 - Abstract Algebra I**

Other Instructorships

Fall 2012 **CSC192H1 - Computer Programming, Algorithms, Data Structures and Languages**, *University of Toronto, Engineering Science*

Spring 2011 **Computer Algebra**, *University of Zurich, Mathematics*

Summer 2008 **Seminar on Computer Algebra**, *University of Zurich, Mathematics*

Course Design

Fall 2020 **MATH9740 - Privacy-aware Artificial Intelligence**, *Graduate Course*

Fall 2017 **MATH2190 - Introduction to Mathematical Cryptography**, *Undergraduate Course*, (Updated Fall 2021)

Other Professional Experience and Service

Committees

Hiring

- 2021
 - Cybersecurity, *Assistant Professor Tenure Track* (member)
 - Mathematics, *Postdoctoral Fellow* (member)
 - Coding Theory, Cryptography, and Number Theory, *RTG Post Doctoral Fellow* (chair)
- 2020
 - Mathematics, *Postdoctoral Fellow* (member)
 - Coding Theory, Cryptography, and Number Theory, *RTG Post Doctoral Fellow* (chair)
- 2018-2019 *Founding Director* of the School of Mathematical and Statistical Sciences (elected member)

College Level

since 2023 Member of the *Science Gateway Courses Task Force*

School level

- 2020-2022 *Graduate Affair committee* member of the School of Mathematical and Statistical Sciences
- 2020-2022 *Global Engagement committee* member of the School of Mathematical and Statistical Sciences
- 2017-2018 *Research Committee* member of the School of Mathematical and Statistical Sciences
- 2014-2016 *Undergraduate Affair Committee* member of the School of Mathematical and Statistical Sciences

Other services

- since 2018 Faculty advisor for the AMS Graduate Students Chapter of Clemson University
- 2016-2022 Undergraduate advisor for students with major in the of the School of Mathematical and Statistical Sciences
- 2017-2019 Faculty mentor for the AWM Graduate Students Chapter of Clemson University

Outcomes of the NSF RTG Grant (2016-2023)

As Co-PI from 2016 to 2018 and Principal Investigator from 2018 to 2023, I managed a team that achieved the following key outcomes under the NSF RTG grant:

- Multi-year financial research support for 14 graduate students.
- Multi-year financial research support for 4 postdoctoral associates.
- Research experience for undergraduates (REU) support for 144 undergraduate students.
- More than 50 peer-reviewed journal articles and conference proceedings.
- Presentations at over 140 conferences.
- Approval of one patent.
- Submission of one digital signature to the NIST competition for post-quantum secure digital signatures.

Administrative Duties as Associate Director for Mathematics and Statistics Education

- Lead for the Division of Mathematical and Statistical Education (Div Math & Stat Ed) and supervisor of the teaching-focused faculty of the School. As of April 2023: 18 Lecturers, 12 Senior Lecturers (SLs), and 8 Principal Lecturers (PLs).
- Perform duties as delegated by the Director or by mutual agreement.
- Oversee the annual Merit Review process for the Div Math & Stat Ed.
- Manage the reappointment processes within the Div Math & Stat Ed: annually for Lecturers, every three years for SLs, and every five years for PLs.

- Oversee the promotion process from Lecturer to SL and from SL to PL.
- Conduct yearly meetings with the Dean of the College of Science regarding School reappointment and promotion cases.
- Meet weekly with the Director and the Associate Directors of the other two school divisions.
- Meet weekly with the Leadership team of the School.
- Direct hiring searches for teaching-focused faculty (lecturers and senior lecturers) and develop a strategic hiring plan for the Division of Math & Stat Ed.
- Nominate teaching-focused faculty for college and university awards.
- Prepare the Division's annual report for inclusion in the School's Annual Report.

Continuing Education

2021-22 **Trailblazers: Provost's Mentoring Initiative for Faculty**, by Clemson University

Description: This initiative prepares faculty for leadership roles in academic or professional organizations while furthering institutional diversity. Focusing on the unique challenges of leadership in higher education, this initiative will provide experiential leadership training. Trailblazer participants will receive the following as part of the program: Leadership and individual development, Experience working on a leadership project that advances gender equity, Match with an executive mentor, Contacts with Clemson leadership, Social learning and networking with other Trailblazers.

Nov 2018 **CONCERT: Clemson ONLINE CERTification**, by Clemson University

Description: CONCERT is a five-week professional development training class delivered asynchronously online via Canvas. CONCERT is an introduction to the Canvas course management system and an overview of course design and pedagogical considerations for online teaching and learning. Learners cultivate skills and techniques for online course development.

July 2017 **Machine Learning**, by *Stanford University on Coursera*, Certificate earned on July 29, 2017

Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine learning and AI)

Languages

Italian (first language), English, German and French (fluent), Spanish (proficient), Farsi (basic).

October 22, 2024