

Aidan W. Murphy

awmurphy@vt.edu ■ [Home Page](#) ■ [LinkedIn](#)

EDUCATION

Ph.D., Mathematics, Virginia Tech, May 2022

M.S., Mathematics, Virginia Tech, May 2020

B.S., Mathematics, S.U.N.Y. Geneseo, May 2017

RESEARCH INTERESTS

algebraic geometry codes, locally recoverable codes, code-based cryptography

EXPERIENCE

Ph.D. Research - Virginia Tech, Blacksburg, VA

- Link: [Codes from norm-trace curves: local recovery and fractional decoding](#)
- Developed lifted codes from norm-trace curves for local recovery.
- Improved on the fractional decoding procedure of Hermitian codes, and adapted to a more general family of codes.
- Advisor: Dr. Gretchen L. Matthews

M.S. Research - Virginia Tech, Blacksburg, VA

- Studied connections between the Tamo-Barg code construction and the work of Giacomo Micheli, with intent to extending these results to codes with availability.
- Advisor: Dr. Gretchen L. Matthews

Internship - Noblis, Reston, VA

- Analyzed the security of quantum random number generation for a Noblis client, with a focus on gathering evidence in a quantum environment.
- Supervisor: Dr. Samuel Gross

PUBLICATIONS

- G. Micheli and A.W. Murphy. Locally recoverable codes and finding good polynomials. Springer Publishing, expected 2023.
- G.L. Matthews, A.W. Murphy, and W. Santos, Fractional decoding of r-Hermitian codes, in review.
- G.L. Matthews and A.W. Murphy. Norm-trace-lifted codes over binary fields. IEEE International Symposium on Information Theory (ISIT), July 2022.
- G.L. Matthews and A.W. Murphy. Cryptography, in Mathematics in Cyber Research. CRC Publishing, February 2022.
- G.L. Matthews, A.W. Murphy, and W. Santos. Fractional decoding of codes from the Hermitian curve. IEEE International Symposium on Information Theory (ISIT), July 2021.
- W. Gerych, L. Buquicchio, K. Chandrasekaran, A. Abdulaziz, H. Mansoor, A. Murphy, E. Rundensteiner, and E. Agu. BurstPU: Classification of Weakly Labeled Datasets with Sequential Bias. IEEE BigData Conference, December 2020.

INVITED CONFERENCE TALKS

- A.W. Murphy, Norm-trace-lifted codes. AMS Fall Central Sectional Meeting, Special Session on Coding, Storage, and Related Applications. Online (October 2021).
- A.W. Murphy, Codes from curves and repair. CanaDAM 2021, Minisymposium on Algebraic and Combinatorial Approaches to Designs and Codes. Online (May 2021).

PROGRAMMING LANGUAGES

Python (SageMath), MATLAB, R, \LaTeX

TEACHING EXPERIENCE

Virginia Tech

Visiting Assistant Professor, Math 1225: Calculus of a Single Variable (x2), Fall 2022

Graduate Teacher of Record, Math 1225: Calculus of a Single Variable, Spring 2022

Graduate Teacher of Record, Math 1225: Calculus of a Single Variable, Fall 2021

Graduate Teacher of Record, Math 1225: Calculus of a Single Variable, Summer II 2021

Graduate Teacher of Record, Math 1226: Calculus of a Single Variable, Spring 2021

Graduate Teacher of Record, Math 1225: Calculus of a Single Variable, Fall 2020

Graduate Teacher of Record, Math 1225: Calculus of a Single Variable, Spring 2020

Math GRE Tutor, VT PREP Program, Fall 2021

Grader, Math 2204: Introduction to Multivariable Calculus, Summer I 2020

Lab Instructor, Math 1026: Elementary Calculus, Spring 2019

Clemson University

Grader, Math 4120: Algebra I, Spring 2018

Grader, Math 3190: Introduction to Proof, Spring 2018

Teaching Assistant, Math 1080: Business Calculus II, Fall 2017

S.U.N.Y. Geneseo

Lab Instructor, Physics 116: General Physics II Lab, Spring 2017

Lab Instructor, Physics 114: General Physics I Lab, Fall 2016

ADDITIONAL PRESENTATIONS

- Codes from the Hermitian curve (guest lecture), Mathematics 5114 (Topics in Algebra: Applied Algebra), Virginia Tech (April 2022).
- Algebraic geometry codes (guest lecture), Mathematics 5114 (Topics in Algebra: Applied Algebra), Virginia Tech (April 2022).
- Making progress on your dissertation, Mathematics Senior Graduate Teaching Assistant (SGTA) Seminar, Virginia Tech (February 2022).
- Welch-Berlekamp decoding of Reed-Solomon codes, Mathematics 5114 (Topics in Algebra: Applied Algebra), Virginia Tech (February 2022).
- Reed-Solomon codes, Mathematics 5114 (Topics in Algebra: Applied Algebra), Virginia Tech (January 2022).
- Norm-trace-lifted codes, Algebra Seminar, Virginia Tech (October 2021).

- Cyclic algebraic geometry codes (Part 2), Applied Algebra Research Group (AARG), Virginia Tech (September 2021).
- Workshop: Creating your own website, Mathematics Senior Graduate Teaching Assistant (SGTA) Seminar, Virginia Tech (August 2021).
- Cyclic algebraic geometry codes (Part 1), Applied Algebra Research Group (AARG), Virginia Tech (August 2021).
- Fractional decoding of codes from Hermitian curves (Part 2), Applied Algebra Research Group (AARG), Virginia Tech (March 2021).
- Fractional decoding of codes from Hermitian curves (Part 1), Applied Algebra Research Group (AARG), Virginia Tech (February 2021).
- Locally recoverable codes, Mathematics Senior Graduate Teaching Assistant (SGTA) Seminar, Virginia Tech (November 2020).
- Finding Tamo-Barg good polynomials with Galois theory (Part 2), Applied Algebra Research Group (AARG), Virginia Tech (February 2020).
- Finding Tamo-Barg good polynomials with Galois theory (Part 1), Applied Algebra Research Group (AARG), Virginia Tech (February 2020).
- Repair scheme of Guruswami and Wootters, Applied Algebra Research Group (AARG), Virginia Tech (October 2019).
- How to Prove (in fewer pages than Bertrand Russell) that $1 + 1 = 2$, Math Club, Clemson University (September 2017).

LEADERSHIP

Graduate and Professional Student Senate, Virginia Tech

- Departmental Senator, Fall 2020 - Spring 2022
- Committee on Judicial and Internal Affairs, Fall 2020 - Spring 2022
- Committee on Judicial and Internal Affairs (Chair), Fall 2020 - Spring 2021
- Constitution Transition Committee, Summer 2021
- Subcommittee on Constitutional Overhaul (Chair), Fall 2020 - Spring 2021
- Parliamentarian of the Senate, Fall 2020 - Spring 2021
- Elections Subcommittee (Chair), Spring 2021

Programming and Data Science Club, S.U.N.Y Geneseo

- Co-Founder
- Vice President, Fall 2016 - Spring 2017
- Treasurer, Fall 2016 - Spring 2017

VOLUNTEER WORK

Explore Physical Sciences Camp Professional Panelist (July 22, 2022)

QACC Candidate Student Host (Spring 2022)

STRIVE for MORE Undergraduate Workshop, Virginia Tech, (September 25-26, 2021)

STRIVE for MORE Undergraduate Workshop, Virginia Tech, (September 26-27, 2020)

MCC Candidate Student Host (Fall 2019)

STRIVE for MORE Undergraduate Workshop, Virginia Tech, (October 26-27, 2019)

Project WISE, Clemson University, (June 24-29, 2018)

MAA Southeastern Section Spring Meeting, Clemson University (March 23-24, 2018)

MAA Seaway Section Spring Meeting, S.U.N.Y. Geneseo (April 15-16, 2016)

Last Updated: 2022/08/05