

Yemeen Ayub

<http://yemeen.com>

Email: yayub@gmu.edu
Address: 4400 University Drive,
Fairfax, Virginia 22030

Education

Aug 2018 - Current **George Mason University**
Fairfax, VA Doctor of Philosophy in *Mathematics*

Sept 2014 - May 2018 **Christopher Newport University**
Newport News, VA Bachelor of Science in *Mathematics and Applied Physics*

Research Experience

Minimal Curvature Embeddings for Dimensionality Reduction | Mason Experimental Geometry Lab
Applied diffusion maps to a dataset to recover a lower dimensional embedding of the same data while retaining certain properties, such as the intrinsic curvature and volume of the original manifold.

Analyzing Gravitational Lenses using Convolutional Neural Network | Capstone Project
Applied a convolutional neural network to images of black holes to recover characteristic values of gravitational lenses, such as the Einstein radius, the complex ellipticities, and the position of the center of the lens.

Skew Polynomials | Independent Study

Created a Mathematica package for polynomials over finite fields to be used in applications such as error-correcting codes. (<https://github.com/Yemeen/SkewPolynomials>)

Work Experience

May 2019 - Current **George Mason University** - Graduate Research Assistant
Fairfax, VA Utilized methods of statistical learning, such as diffusion maps, neural networks, and delay embeddings in order to analyze data.

Sept 2018 - May 2019 **George Mason University** - Graduate Teaching Assistant
Fairfax, VA Taught recitations for multivariable calculus and ordinary differential equations. Responsible for making and grading weekly quizzes and study guides.

May 2017 - Nov 2017 **Mathnasium** - Math Instructor/Tutor
Yorktown, VA Taught students the fundamentals of mathematics from basic arithmetic to calculus. Collaborated with other instructors to create lesson plans for individual students, with a focus placed on fortifying the student's mathematical speed, independence, and focus.

Awards

Clarke Family Award for Excellence in Algebra, Analysis, and Topology 2019
Pi Mu Epsilon, Mathematics Honorary Society 2018
Physics, Computer Science, and Engineering Department International Travel Fellowship Award 2017
First place at Christopher Newport University Ethical Hacking Competition 2016

Articles

Rotational Symmetries of Sequential Matrices with Applications to the Jacobi Symbol - Y. Ayub and C. Samuels (PUMP Journal of Undergraduate Research 2019)
A Special Case of Centrosymmetric Matrices - Y. Ayub (In Preparation)
Rotational Symmetries of Sequential Matrices - O. Babb, A. Malhotra, Y. Ayub, T. Berry (In Preparation)
Supervised Dimensionality Reduction Methods for Eliminating Nuisance Variables - J. Westhoven, Y. Ayub, T. Berry (In Preparation)

Presentations

Applications of Diffusion Maps to Dimensionality Reduction - Richmond Area Mathematical Sciences Conference Spring 2020 (Cancelled for COVID-19) and SIAM Conference on Mathematics of Data Science Spring 2020 (Cancelled for COVID-19)

Rotational Symmetries of Sequential Matrices - George Mason University Spring 2019

Applications of Diffusion Maps - Mason Experimental Geometry Lab Symposium Fall 2018

Finite Fields Package for Mathematica - CNU Paideia Spring 2018

Analysis of Strong Gravitational Lens using Convolutional Neural Networks - CNU Paideia Spring 2018

Skills

Programming: Java, Python, HTML, CSS, LaTeX, Matlab, and Mathematica

Software: Windows, Linux, macOS, Microsoft Office Suite, Adobe Creative Suite, Git, TensorFlow and Sony Vegas

Languages: English and Italian