

# GRAHAM ENOS

## Summary

More than 10 years of mathematical research, computer programming, and education experience; Extensive experience in data science, modeling, visualization and analysis; Previously held Top Secret/SCI clearance; passed special background investigation, full scope polygraph.

### AREAS OF EXPERTISE

- Data Science, Statistical Data Mining and Modeling, Software Development
- Programming in Scala, Python (including “data stack,” e.g. NumPy and Pandas), C, C++ (especially modern C++11, etc.), R, SQL, Haskell
- Elliptic Curve Public Key Cryptography, Computational and Algorithmic Abstract Algebra and Group Theory

## Relevant Experience

2016–Present

*Senior Data Scientist*, QUANTIFIND, INC., Washington, DC

- Conducting literature review and original research to answer open-ended questions prompted by product and stakeholder requests
- Prototyping novel machine learning algorithms and models in Python and R
- Developing and integrating models and algorithms into a monolithic multi-developer Scala code base, conducting unit and integration testing, issuing and responding to code reviews, following other software engineering best practices, deploying at scale
- Incorporating new data sources into our product stack, setting up and administering PostgreSQL databases

2012–2016

*Applied Research Mathematician*, DEPARTMENT OF DEFENSE, Fort Meade, MD

- Received cash award in 2013 for saving an immense amount of time, effort, and money by advocating for continuous integration and developing an internal tool that drastically

shortened development feedback loop for a large scale, multi-developer, mission-critical high performance computing project

- Researched state of the art in automatic language-independent text summarization, then developed, documented, and tested a new text summarization algorithm
- Examined, extracted, cleaned, explored, visualized, and modeled data from multiple, disparate sources of varying consistency and quality using a variety of statistical techniques and analytical tools
- Engineered a simple web-based platform for briefing team's work to senior leadership and interested customers
- Optimized development cycle of plugins for a large internal software tool
- Scripted data flows, analysis, and processing, leveraging high performance computing platforms in support of mission
- Conducted mathematical research and computer experiments exploring innovative approaches to long-term research goals in public key cryptography
- Selected to be a Teaching Assistant for internal Statical Data Analysis and Data Mining course and was the only TA explicitly praised in student evaluation forms
- Collaborated with other mathematicians, software developers, technical experts, and non-technical customers on a variety of time-sensitive critical projects
- Trained in data mining, machine learning, cryptanalysis, computer security, information assurance, computer network exploitation, software reverse engineering
- Authored internal technical/mathematical papers and software tools to advance the state of the art in language-independent text summarization, anomalous object detection in large data sets, and public key cryptography

2012

*Analytical Consultant*, BOOZ ALLEN HAMILTON, McLean, VA

- Studied application of Natural Language Processing to in-house phishing email training
- Conducted research and analysis of personnel hierarchy with Python, GraphViz, Excel, and Visual Basic
- Extended a database application in Microsoft Access

2010-2012

*Graduate Assistant*, UNCC DEPARTMENT OF MATHEMATICS AND STATISTICS, Charlotte, NC

- Nominated for 2010-2011 Outstanding Graduate Teaching Assistant Award
- Planned and presented professional development to other graduate assistants as a Graduate Teaching Fellow
- Performed full instructor responsibilities, wrote and presented lectures, conducted office hours, created and graded tests and homework sets, and organized online work through the departments WebWork system for Calculus I, Calculus II, and Calculus III

2009-2010

*Grader/Tutor*, UNCC DEPARTMENT OF MATHEMATICS AND STATISTICS, Charlotte, NC

- Graded homework sets and tests for Advanced Applied Mathematics, Differential Equations, and Linear Algebra courses
- Provided tutoring and instruction in the Math Learning Center

2008-2009

*Family Room Specialist*, THE APPLE STORE, SOUTH PARK, Charlotte, NC

- Recommended various products, services, and training
- Provided individual training on various Apple products
- Performed triage and repairs on portable Apple Hardware
- Translated difficult computing concepts into meaningful and clear terms for customers
- Discussed customers desires and needs to decide proper computing solution
- Carried out transactions at the Point of Sale and on mobile devices
- Cleaned up and restocked items on the sales floor
- Constantly learned about computers and technology industry through structured personal development

2008-2009

*Mathematics Tutor*, SYLVAN LEARNING CENTER, Mooresville, NC

- Provided homework help, general instruction, and guided learning for High School students in their mathematics classes spanning Algebra I, Geometry, and Algebra 2
- Conferred with colleagues about student performance and progress

- Tracked student progress and achievement
- Recommended areas of concentration, study tips and strategies, and best practices

2007-2008

*High School Mathematics Teacher*, BUCKEYE UNION HIGH SCHOOL, Buckeye, AZ

- Selected as a member of Teach For America to teach Freshmen and Sophomores in Intro to Algebra and Basic Math Lab
- Instructed students
- Created lesson plans
- Graded homework, classwork, quizzes, and tests
- Maintained grade records and tracked student growth
- Provided extra help for students outside of class time
- Troubleshoot and managed student accounts on A+LS computer-based learning system for Basic Math Lab
- Conferred with Program Director and Arizona State University Mentor Teacher about successes and areas for growth in my classroom, strategies for increasing student engagement and achievement, and professional development

Summer 2007

*High School Mathematics Teacher*, ATLANTA PUBLIC SCHOOLS, Atlanta, GA

- Trained to be a Public School Teacher at Teach For Americas 2007 Summer Institute at Georgia Institute of Technology
- Team-taught a Geometry class
- Created lesson plans
- Graded homework, classwork, and exams
- Tracked student achievement
- Attended seminars on effective instruction, classroom management, developing a class culture, incorporating literacy into instruction
- Conferred with Corps Member Advisor several times per week regarding both student and personal performance

- Observed other Corps Members and teachers

2006–2007

*Grader/TA*, BATES COLLEGE DEPARTMENTS OF MATHEMATICS AND PHILOSOPHY, Lewiston, ME

- Graded homework and exams, maintained homework records, developed answer keys, and discussed student progress and met with student individually for students in Multivariable Calculus and Introduction to Logic.

May 2005

*Teaching Assistant*, BATES COLLEGE MATHEMATICS DEPARTMENT, Lewiston, ME

- Selected as a sophomore to assist three professors in Introduction to Abstraction, a Mathematics course mandatory for all potential math majors
- Instructed students in logic, proof styles, elementary number theory, abstract algebra, and real analysis, and typesetting in  $\text{\LaTeX}$
- Provided help for students during group work
- Lectured a class
- Scheduled, prepared, and administered review sessions before each exam
- Graded homework

2004–2006

*Mathematics Tutor*, BATES COLLEGE MATHEMATICS AND STATISTICS WORKSHOP, Lewiston, ME

- Provided Tutorial Support to Calculus I and II students once a week during the Workshops school night Calculus Help Sessions
- Enlisted as a private tutor for two students on an individual basis in Calculus I and II, respectively

Summer 2004 & 2005 *Teacher's Aide*, EASTER SEALS OF SOUTHEASTERN PENNSYLVANIA, Levittown, PA

- Assisted in teaching a class for students with multiple disabilities, in such areas as Occupational and Physical Therapy, interpersonal communication, and appropriate behavior
- Performed client services such as feeding and changing
- Rode the school bus several afternoons a week to ensure student health and safety on ride home

## Education

2009–2013

PH.D. IN APPLIED MATHEMATICS, *University of North Carolina at Charlotte*, Charlotte, NC

Wrote and defended dissertation “Binary Edwards Curves and Elliptic Curve Cryptography” while working full time as an Applied Research Mathematician at the U.S. Department of Defense; Dr. Yuliang Zheng & Dr. Gabor Hetyei, advisors

2007

B.A. IN MATHEMATICS & PHILOSOPHY, *Bates College*, Lewiston, ME

3.93 GPA; graduated Summa Cum Laude, Phi Beta Kappa, & Sigma Xi

## Publications

- Graham Enos. *Complete and unified group laws are not enough for elliptic curve cryptography*. Cryptology ePrint Archive, Report 2013/015, 2013.
- Graham Enos and Yuliang Zheng. *An id-based signcryption scheme with compartmented secret sharing for unsigncryption*. Information Processing Letters, 115(2):128 – 133, 2015.