Justin Yirka

Candidate for B.S. in Computer Science and B.S. in Mathematical Sciences
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Curriculum Vitae

Research Interests

Complexity theory, Algorithms, Quantum Computing, Formal Methods

Education

Bachelor of Science in Computer Science 2014 - 2018
Bachelor of Science in Mathematical Sciences
Dual degree program
Virginia Commonwealth University (VCU)
- Member of Honors College
- Minor in Physics
- GPA: 3.97

International Baccalaureate Diploma 2014
Gar-Field Senior High School, Woodbridge, VA
- IB Diploma score: 37 out of possible 45. 87th percentile globally.
- GPA: 4.57

Employment

- Research Assistant Summer 2017
  Joint Center for Quantum Information and Computer Science, University of Maryland (UMD)
- Undergraduate Research Assistant 2015 - current
  Quantum Computing Lab, Virginia Commonwealth University, Richmond, VA
- Teaching Assistant 2016 - current
  Math Department, Virginia Commonwealth University, Richmond, VA
- Lifeguard, CPR, and First Aid Instructor 2016 - current
  Prince William County Department of Parks and Recreation, Woodbridge, VA
- Waterpark Supervisor 2011 - 2016
  Prince William County Department of Parks and Recreation, Woodbridge, VA

Research

Pre-prints

- S. Gharibian and J. Yirka. The complexity of estimating local physical quantities. 2016
  Available at https://arxiv.org/abs/1606.05626

Research Poster Presentations

- S. Gharibian and J. Yirka. The complexity of estimating local physical quantities.
  - 20th Annual Conference on Quantum Information Processing (QIP 2017) 2017

Networking

- J. Yirka. Evaluation of TCP header fields for data overhead efficiency.
  - 30th National Conference on Undergraduate Research (NCUR 2016) 2016
  - VCU Symposium for Undergraduate Research and Creativity 2015

Invited Talks

- Quantum complexity of estimating local physical quantities. 2016
  Weekly department seminar, Department of Computer Science, VCU

Research Internships

- Joint Center for Quantum Information and Computer Science, Univ. of Maryland Summer 2017
  - Supervisor: Andrew Childs Childs, Ph.D.
  - Funded by: UMD-CAAR NSF REU (see *Funding and Scholarships*)
- Quantum Computing Lab, Virginia Commonwealth University 2015 - current
  - Supervisor: Sevag Gharibian, Ph.D., Department of Computer Science
  - Topic: Computational complexity of physical problems

Funding and Scholarships

- Presidential Scholarship 2014 - 2018
  Virginia Commonwealth University. Approx. $110,000 USD.
  Details: Top scholarship offered. Full cost of 4-year tuition, room, and board.
- NSF Research Experience for Undergraduates (REU) Award 2017
  University of Maryland. Approx. $5,300 USD.
- Travel grant for poster presentation at QIP 2017 2017
  VCU Honors College. $500 USD.
- Travel grant for poster presentation at NCUR 2016 2016
  VCU Honors College. Approx. $550 USD.
- Presidential Scholarship (declined) 2014
  Worcester Polytechnic Institute. Approx. $80,000 USD.
- Rensselaer Medal Merit Scholarship (declined) 2014
  Rensselaer Polytechnic Institute. Approx. $100,000 USD.

Teaching Experience

Teaching Assistant

- Algebra with Applications (MATH 141), Virginia Commonwealth University 2016 – current
  Graded assignments, offered weekly help sessions, assisted with in-class assignments.
  Details: 1st year mathematics course. Up to 24 students.
- Honors Rhetoric (HONR 200), Honors College, Virginia Commonwealth University 2015
  Critiqued student research papers and methods, assisted with in-class assignments.
  Details: 1st year honors writing and composition course. 17 students.

Instructor

- Lifeguard, first aid, and management certification classes, 2016 - current
  Prince William County Department of Parks and Recreation, Woodbridge, VA
  Details: Planned and managed hands-on classes of up to 40 students.

Student Supervision

Mentor

- Derek Pham, Virginia Commonwealth University 2016
  Details: Part of VCU Honors freshman mentorship program.

Awards and Honors

- Dean's List – seven-time recipient 2014 - 2017
  VCU School of Engineering, VCU College of Humanities & Sciences
- VCU Scholar Award 2015
  Virginia Commonwealth University
- Launch Award for Outstanding Research Poster 2015
  VCU Symposium for Undergraduate Research and Creativity
- Volunteer of the Year 2014
  Prince William County Schools, VA
  Details: Awarded for commitment to grade school robotics program.
- Youth Salute national youth leader nominee 2013
  National Council on Youth Leadership, Prince William County chapter

Service

University Service

- Member, Student Advisory Board 2016 - current
  Department of Computer Science, Virginia Commonwealth University
  Details: Advise on student concerns. Participate in faculty hiring interviews.
- Senior Reader, Senior honors graduation dossiers 2016 - current
  Honors College, Virginia Commonwealth University
  Details: Review dossier submissions for graduation. Coordinate other readers.
- Organizer, Local Hack Day in Richmond, VA at VCU 2016
  School of Engineering and RamDev club, Virginia Commonwealth University
  Details: Hosted event for over 30 students, including high school students.
- Volunteer, High School Computer Science Day 2016
  Department of Computer Science, Virginia Commonwealth University
- Judge, Launch award for Outstanding Research Poster 2016
  VCU Symposium for Undergraduate Research and Creativity
- Research Ambassador volunteer 2016
  VCU Symposium for Undergraduate Research and Creativity

Organization Service

- Founder and President, RamDev – Software Development Club 2016 - current
  Virginia Commonwealth University
  Details: Plan weekly meetings, including securing funding and involving student, faculty, and industry speakers.
- Treasurer, Association for Computing Machinery Programming Club 2016 - current
  Virginia Commonwealth University

Community Service

- Volunteer, FIRST and Vex robotics competitions 2011 - 2015
  Prince William County Schools, VA
- Mentor, FIRST Tech Challenge robotics team 2014
  Wilder Middle School, Richmond, VA

Selected Programming Projects

- "GeoViewer" Android app 2016
  Semester project for VCU CMSC 355: Software Engineering.
  Details: Group project in Agile development. Enables users to visit geocached photos shared by other users. Implemented in Java with Android Studio.
- "Run Planner," implemented in Mathematica / Wolfram language 2016
  Developed at RamHacks 2016 hackathon.
  Details: Utilizes GPS data to plot jogging route of given distance along city road network.
- "GroupMe Stats" Android app 2016
  Developed at VT Hacks 2016 hackathon.
  Details: Uses GroupMe API to provide user with interesting statistics on Android platform.
- Zero Robotics International Space Station Programming Challenge 2012 – 2014
  Competed in MIT sponsored robotics competition for robots aboard ISS. Implemented in C++.
  Qualified for international finals two years in a row.
- After-school student management system 2013 – 2014
  Course project for senior computer science course. Developed for use by school staff.
  Details: Implemented in Java. GUI application provides database for student information.
- Padlock inventory system 2012 – 2013
  Course project for junior computer science course. Implemented in Java.

Familiar with: Java, C++, C, Perl (with NLP applications), Mathematica, Lua, LaTeX

Selected Courses

Virginia Commonwealth University

- Theory of Computation – 2016
- Computer Organization - 2016
- Algorithms and Data Structures – 2016
- Operating Systems – 2016
- Software Engineering – 2016
- Artificial Intelligence – 2016
- Intro to Data Science – 2016
- Multivariate Calculus – 2015
- Differential Equations – 2015
- Linear Algebra – 2015
- Mathematical Reasoning – 2015
- Intro to Statistics - 2016
- Graphs and Algorithms – 2016
- Abstract Algebra – 2016

- Programming Languages – 2017
- Intro to Natural Language Processing - 2017
- Advanced Calculus - 2017