

Justin Yirka

Candidate for B.S. in Computer Science and B.S. in Mathematical Sciences
Virginia Commonwealth University, Richmond, VA, USA

Email: YirkaJk@vcu.edu
Phone: (703) 229-7956
www.linkedin.com/in/yirkajk



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. 87 th percentile globally. | |
| ○ GPA: 4.57 | |

Employment

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|---|----------------|
| • 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.
- Research Expert/Panelist, Undergraduate conference (NCUR) preparation sessions 2017
Honors College, Virginia Commonwealth University
- 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. Encourage collaboration and discussion within department.
- 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
- Multivariate Calculus – 2015
- Differential Equations – 2015
- Linear Algebra – 2015
- Mathematical Reasoning – 2015
- Intro to Statistics - 2016
- Graphs and Algorithms – 2016

- Intro to Data Science – 2016
- Programming Languages – 2017
- Intro to Natural Language Processing - 2017
- Abstract Algebra – 2016
- Advanced Calculus - 2017