

# Justin Yirka

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

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## *Curriculum Vitae*

### **Research Interests**

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Complexity theory, Algorithms, Quantum Computing, Formal Methods

### **Education**

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|--|-------------|
| 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 <sup>th</sup> percentile globally. |             |
| ○ GPA: 4.57  |             |

### **Research**

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#### **Research Internships**

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|--|-------------|
| • Undergraduate Research Assistant                                   | 2015 - 2016 |
| Quantum Computing Lab, Virginia Commonwealth University              |             |
| ○ Supervisor: Sevag Gharibian, Ph.D., Department of Computer Science |             |
| ○ Topic: Computational complexity of physical problems               |             |

#### **Pre-prints**

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|--|------|
| • S. Gharibian and J. Yirka. The complexity of estimating local physical quantities.         | 2016 |
| Available at <a href="https://arxiv.org/abs/1606.05626">https://arxiv.org/abs/1606.05626</a> |      |

#### **Research Poster Presentations**

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|--|------|
| • S. Gharibian and J. Yirka. The complexity of estimating local physical quantities. |      |
| ○ 20 <sup>th</sup> Annual Conference on Quantum Information Processing (QIP 2017)    | 2017 |

#### *Networking*

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

#### **Invited Talks**

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

## **Funding and Scholarships**

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- Presidential Scholarship 2014 - 2018  
Virginia Commonwealth University. Approx. \$110,000 USD.  
Details: Top scholarship offered. Full cost of 4-year tuition, room, and board.
- 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**

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### **Teaching Assistant**

- Algebra with Applications (MATH 141), Virginia Commonwealth University 2016 - present  
Graded assignments, offered weekly help sessions, assisted with in-class assignments.  
Details: 1<sup>st</sup> 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: 1<sup>st</sup> year honors writing and composition course. 17 students.

### **Instructor**

- Lifeguard, first aid, and management certification classes, 2016 - present  
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**

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- 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**

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### **University Service**

- Member, Student Advisory Board 2016 - present  
Department of Computer Science, Virginia Commonwealth University  
Details: Advise on student concerns. Participate in faculty hiring interviews.
- Senior Reader, Senior honors graduation dossiers 2016 - present  
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 attendees, 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 - present  
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 - present  
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

## **Employment**

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- Teaching Assistant 2016 - present  
Math Department, Virginia Commonwealth University, Richmond, VA
- Lifeguard and First Aid Instructor 2016 - present  
Prince William County Department of Parks and Recreation, Woodbridge, VA
- Waterpark Supervisor 2011 - 2016  
Prince William County Department of Parks and Recreation, Woodbridge, VA

- Undergraduate Research Assistant 2015  
Quantum Computing Lab, Virginia Commonwealth University, Richmond, VA

## **Programming Experience**

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- “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.
- “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.

## **Selected Courses**

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### Virginia Commonwealth University

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|---|---------------------------------|
| • Theory of Computation – 2016                | • Multivariate Calculus – 2015  |
| • Computer Organization - 2016                | • Differential Equations – 2015 |
| • Algorithms and Data Structures – 2016       | • Linear Algebra – 2015         |
| • Operating Systems – 2016                    | • Mathematical Reasoning – 2015 |
| • Software Engineering – 2016                 | • Intro to Statistics - 2016    |
| • Artificial Intelligence – 2016              | • Graphs and Algorithms – 2016  |
| • Intro to Data Science – 2016                | • Abstract Algebra – 2016       |
| • Programming Languages – 2017                | • Advanced Calculus - 2017      |
| • Intro to Natural Language Processing - 2017 |                                 |