

# 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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## Research Interests

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Quantum computing, Complexity theory, Algorithms

## Education

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**B.S. in Computer Science** 2014 - 2018

**B.S. in Mathematical Sciences (concentration in pure math)**

Dual degree program

Virginia Commonwealth University (VCU), Richmond, VA

- University Honors College candidate
- 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 (88<sup>th</sup> percentile globally).

## Research

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### Research Internships

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**Joint Center for Quantum Information and Computer Science (QuICS),** 2017

University of Maryland (UMD)

Supervisor: Andrew Childs, Ph.D.

Topic: Pure-state tomography with Pauli observables

**Quantum Computing Lab,** Virginia Commonwealth University 2015 - 2016

Supervisor: Sevag Gharibian, Ph.D.

Topic: Computational complexity of local physical problems and of quantum oracles

### Research Papers

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S. Gharibian and J. Yirka. The complexity of simulating local measurements on quantum systems.

Available at <https://arxiv.org/abs/1606.05626>

**To appear in:**

*Proceedings of 12<sup>th</sup> Conference on the Theory of Quantum Computation, Communication, and Cryptography (TQC 2017).*

**Contributed talk:**

12<sup>th</sup> Conference on the Theory of Quantum Computation, Communication, and Cryptography (TQC 2017). Presented by S. Gharibian. 2017

**Poster presentation:**

20<sup>th</sup> conference on Quantum Information Processing (QIP 2017). 2017  
*Presented under a different title.*

**Invited talk:**

Weekly department seminar, Department of Computer Science, VCU 2016

J. Yirka. Evaluation of TCP header fields for data overhead efficiency.

Available at <http://scholarscompass.vcu.edu/uressposters/148/>

**Poster presentations:**

• 30<sup>th</sup> National Conference on Undergraduate Research (NCUR 2016) 2016

• VCU Symposium for Undergraduate Research and Creativity 2015

**Awarded** “Launch Award” for Outstanding Research Poster.

**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.

NSF Research Experience for Undergraduates (REU). 2017

Combinatorics and Algorithms for Real Problems REU, UMD. Apprx. \$6,000 USD.

NSF-CCF-15601931

Details: Stipend and housing to fund summer research position with UMD QuICS.

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.

**Awards and Honors**

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Dean’s List – ten-time recipient 2014 - 2017

VCU School of Engineering, VCU College of Humanities & Sciences

University Student 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.

**Teaching Experience**

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**Teaching Assistant**

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Algebra with Applications (MATH 141), Virginia Commonwealth University 2016 - current

Assist with in-class exercises, offer weekly help sessions, grade assignments.

Details: First-year mathematics course. Up to 24 students.

Honors Rhetoric (HONR 200), Honors College, Virginia Commonwealth University 2015  
Critiqued student research papers, assisted with in-class work and discussions.  
Details: First-year honors writing and composition course. 17 students.

### **Instructor**

Lifeguard, first aid, and management certification courses, 2016 - current  
Prince William County Department of Parks and Recreation, Woodbridge, VA  
Details: Plan and manage highly-dynamic courses for a variety of students in non-traditional class environments. Class sizes of up to 40 students.

### **Mentor**

1<sup>st</sup> year student, Virginia Commonwealth University 2016  
Details: Part of VCU Honors freshman mentorship program.

## **Service**

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### **University Service**

Student Advisory Board member 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 candidates. Coordinate other readers.

Panelist, Undergraduate conference preparation sessions 2017  
Honors College, Virginia Commonwealth University

Organizer, Local Hack Day of Richmond, VA hosted at VCU 2016  
Hosted through RamDev software club (see below)  
Details: Planned and hosted an event for over 30 students including 12 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

### **Organization Service**

Founder and President 2016 - current  
RamDev – the software development club at VCU  
Details: Secure funding for, advertise, and plan weekly meetings featuring student, faculty, and industry speakers. Encourage increased collaboration and growth in CS department.

Treasurer 2016 - current  
Association for Computing Machinery Programming Club

### **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