Justin Yirka

Curriculum Vitae

B.S. in Computer Science and B.S. in Mathematics
Virginia Commonwealth University, Richmond, VA, USA

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Research Interests

Quantum computing, algorithms, complexity theory

Education

Virginia Commonwealth University (VCU)   **Richmond, VA**

B.S. in Computer Science, GPA: 3.98 / 4.0   *(Dual degree program) 2018*

B.S. in Mathematical Sciences
    Concentration in Pure Math   Specialization in Data Science
    Minor in Physics
    University Honors

Research

Experience

Graph Theory Computational Discovery Lab, VCU

Research Assistant   *Summer 2018*
    Supervisor: Craig Larson, Ph.D.
    Topic: Use of automated conjecturing software to find conditions for graph hamiltonicity.

Joint Center for Quantum Information and Computer Science (QUCIS),
University of Maryland (UMD)

NSF REU Undergraduate Researcher   *Summer 2017*
    Supervisor: Andrew Childs, Ph.D.
    Topic: Quantum tomography. Pure-state tomography with Pauli observables.
    Support: NSF Research Experience for Undergraduates (REU) CAAR. PI: William Gasarch, Ph.D.

Quantum Computing Lab, VCU

Undergraduate Research Assistant   *2015–2016*
    Supervisor: Sevag Gharibian, Ph.D.
    Topics: Quantum computational complexity, complexity of local measurements, quantum oracle classes
    (e.g. $P^{QMA[log]}$), quantum variants of the polynomial hierarchy.

Pre-prints

Gharibian, Sevag, Stephen Piddock, and **Yirka, Justin**. "Local measurements on physical Hamiltonians and oracle complexity classes". Preprint available soon. 2018.

Gharibian, Sevag, Miklos Santha, Aarthi Sundaram, and **Yirka, Justin**. "Quantum generalizations of the polynomial hiearchy with applications to QMA(2)". Preprint available soon. 2018.

Gharibian, Sevag and **Yirka, Justin**. "The complexity of simulating local measurements on quantum systems". Available at https://arxiv.org/abs/1606.05626. 2016.

Scholarships (all dollar amounts in USD)

Presidential Scholarship
$110,000, Virginia Commonwealth University   *2014–2018*
 Top scholarship offered. Full cost of 4-year tuition, room, and board.
 Awarded to 0.6% of students

Presidential Scholarship *[unable to accept]*
$80,000, Worcester Polytechnic Institute   *2014*

Rensselaer Medal Merit Scholarship *[unable to accept]*
$100,000, Rensselaer Polytechnic Institute   *2014*

Funding

Event grants for *RamDev* seminar series
$1,900, VCU Student Government Association   *2016–2018*

Travel grant for presentation at QIP 2017
$500, VCU Honors College   *2017*

Travel grant for presentation at NCUR 2016
$550, VCU Honors College   *2016*

Awards and Honors

Pure Mathematics Award
VCU College of Humanities and Sciences   *2018*
 Awarded to student in pure mathematics concentration with highest graduating GPA.

Mark A. Sternheimer Capstone Design Award
VCU School of Engineering   *2017*
 For "innovation and entrepreneurship" of senior project developing mobile app.
 Included grant of $660.

University Student Scholar Award
Virginia Commonwealth University   *2015*

Launch Award for Outstanding Research Poster
VCU Symposium for Undergraduate Research and Creativity   *2015*
 For poster "Evaluation of TCP header fields for data overhead efficiency".

Volunteer of the Year
Grade-school robotics program, Prince William County Schools, VA   *2014*

Teaching Experience

VCU..

Teaching Assistant
Algebra with Applications (MATH 141) *(2 semesters) 2016–2017*
    Assisted with in-class work, offered tutorials, graded assignments.
    Average student evaluation scores — Fall 2016: 4.78 / 5.0, Spring 2017: 4.36 / 5.0.

Mentor for 1st year student
Honors freshman mentorship program *Fall 2016*

Teaching Assistant
Honors Rhetoric (HONR 200) — first-year honors writing and research course *Fall 2015*
    Assisted with in-class work and critiqued student papers.

Other..

Instructor
CPR, first-aid, and lifeguarding courses *2016–2018*
Department of Parks and Recreation, Prince William County, VA

Service

University service (VCU)..

Student Advisory Board member
Department of Computer Science *2016–2018*
    o Invited to School of Engineering strategic planning retreat, 2017 (only CS undergraduate).
    o Participated in hiring interviews for new faculty, 2017 (one of two students to participate).

Senior Reader for Honors graduation dossiers
Honors College *(2 academic years) 2016–2017*
    Assessed papers submitted in fulfillment of University Honors. Coordinated other readers.

Panelist — Career workshop for freshman mentorship program
Department of Computer Science *2017*

Panelist — Undergraduate conference preparation workshops
Honors College *2017*

Judge — Launch Award for Outstanding Research Poster
VCU Symposium for Undergraduate Research and Creativity *2016*

Organizer — Local Hack Day of Richmond, VA
Major League Hacking (MLH) and VCU Department of Computer Science *2016*
    Hosted event for 30 students including 12 high school students.

Extracurricular service

Founder and President
RamDev: Software Development at VCU *2016–2018*
- Coordinated 46 weekly seminars including 9 corporate speakers.
- Secured and managed $2400 in funding and resources.
- Increased weekly attendance to 20 students, becoming largest C.S. organization at VCU.

Community service

Volunteer for grade school FIRST & Vex robotics competitions
Prince William County Schools, VA *2011–2015*
Awarded "Volunteer of the Year", 2014.

Mentor to middle school Vex robotics team
Wilder Middle School, Richmond, VA *2014*

Master thesis

title: *Title*

supervisors: Supervisors

description: Short thesis abstract

Experience

Vocational

Employer **City**
Job title *year–year*
General description no longer than 1–2 lines.
Detailed achievements:
- Achievement 1;
- Achievement 2, with sub-achievements:
  - Sub-achievement (a);
  - Sub-achievement (b), with sub-sub-achievements (don't do this!);
    · Sub-sub-achievement i;
    · Sub-sub-achievement ii;
    · Sub-sub-achievement iii;
  - Sub-achievement (c);
- Achievement 3.

Employer **City**
Job title *year–year*
Description line 1
Description line 2

Employer City
Job title *year–year*
Description

Languages

Language 1: Skill level *Comment*

Language 2: Skill level *Comment*

Language 3: Skill level *Comment*

Computer skills

category 1: XXX, YYY, ZZZ **category 4**: XXX, YYY, ZZZ

category 2: XXX, YYY, ZZZ **category 5**: XXX, YYY, ZZZ

category 3: XXX, YYY, ZZZ **category 6**: XXX, YYY, ZZZ

Interests

hobby 1: Description

hobby 2: Description

hobby 3: Description

Extra 1

o Item 1

o Item 2

o Item 3. This item is particularly long and therefore normally spans over several lines. Did you notice the indentation when the line wraps?

Extra 2

o Item 1 o Item 4

o Item 2 o Item 5

o Item 3

o Item 6. Like item 3 in the single column list before, this item is particularly long to wrap over several lines.

References

Category 1
o Person 1
o Person 2
o Person 3

Category 2
Amongst others:
o Person 1, and
o Person 2
(more upon request)

All the rest & some more
That person, and **those** also (all available upon request).