

# Ruiran Xun

## curriculum vitae

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## SCIENCES

### EDUCATION

#### Carnegie Mellon University (CMU)

Pittsburgh, PA

Bachelor of Science in Chemistry, Additional Major in Computer Science

May 2022

Cumulative GPA: 3.90 (as of May 2020)

Chemistry courses: Honors Chemistry, Inorganic Chemistry, Modern Organic Chemistry  
Introduction to Chemical Analysis, Organic Synthesis and Analysis

CS courses: Matrices and Linear Transformations, Calculus in Three Dimensions  
Probability, Great Ideas in Theoretical Computer Science  
Principles of Imperative Computation, Introduction to Computer Systems  
Principles of Functional Programming

#### Thomas Jefferson High School for Science and Technology (TJHSST)

Alexandria, VA

Advanced Studies Diploma

June 2018

Relevant courses: AP Chemistry, Organic Chemistry  
Multivariable Calculus, Complex Analysis, Differential Equations  
Artificial Intelligence I & II, Web App Design, Computer Systems Lab

### RESEARCH EXPERIENCE

#### Noonan Group – Carnegie Mellon University, Pittsburgh, PA

May 2019 – present

- Conducted research through the CMU Summer Undergraduate Research Apprenticeship
- Investigates novel syntheses of cations that functionalize anion exchange membranes
- Utilizes standard organic synthesis techniques as well as GPC, H-NMR, and IR analysis

#### Porco Group – Boston University, Boston, MA

Jul 2017 – Aug 2017

- Conducted studies towards a novel synthesis of indoles with concurrent group migration
- Investigated a new reaction pathway inspired by an unexpected result in mentor's work
- Worked up reactions and employed H-NMR, C-NMR, and UPLC-MS analysis

### WORK EXPERIENCE

#### SWE Intern – Network Medical Management, Alhambra, CA

Jun 2020 – Aug 2020

- Will work on full-stack development of apps used by medical professionals and patients

#### University Board Member – CMU, Pittsburgh, PA

Mar 2019 – present

- Serves on the Academic Review Board (ARB) and University Disciplinary Committee (UDC)

#### Computer Science Teaching Assistant – CMU, Pittsburgh, PA

Aug 2019 – present

- Teaching assistant for 15-122: Principles of Imperative Computation (Fall 2019, Spring 2020)
- Assists in teaching code correctness, data structures, and algorithms to over 500 students
- Leads recitations and labs, facilitating a collaborative environment for student learning
- Guides student understanding of concepts and assignments one-on-one in office hours

#### Content Writing Intern – Expil, Inc., Pittsburgh, PA

Sep 2018 – May 2019

- Created educational content aimed at a target demographic of high school students
- Authored problems, solutions, and topic explanations in mathematics, primarily Algebra 1
- Assisted in creation of mathematics curricula based upon existing pedagogical research

#### Head Chemistry Teaching Assistant – TJHSST, Alexandria, VA

Jun 2018 – Jul 2018

- Facilitated communication between teachers and other TAs
- Kept in correspondence with parents of students regarding the summer curriculum
- Created quizzes and other review materials to provide to the 130-student class

- Responsibilities also included those listed below under "Chemistry Teaching Assistant"

**Chemistry Teaching Assistant** – TJHSST, Alexandria, VA

**Jul 2016 – Aug 2016**

- Helped teach the Honors Chemistry I curriculum in an accelerated timeframe of 5 weeks
- Worked with students to support them in better understanding chemistry concepts
- Devised and taught a unit on organic chemistry alongside other TAs

## LEADERSHIP

**Secretary** – Scotch'n'Soda Theatre, Pittsburgh, PA

**May 2019 – May 2020**

- Oversaw production of six to seven shows per academic year by over 200 active members
- Communicated key events and information to general membership weekly through emails
- Connected with members of current productions to proactively identify/remedy conflicts

**Logistics Officer** – CMIMC Organizing Team, Pittsburgh, PA

**May 2019 – May 2020**

- Oversaw the operations of the Carnegie Mellon Informatics and Mathematics Competition
- Coordinated scheduling of 400+ high school participants over multiple competition rounds

## PROJECTS

**Personal Website**

**2020**

- Created responsive design using Bootstrap Studio, then fine-tuned the HTML and CSS
- Deployed to Github Pages through a custom domain; secured using Comodo PositiveSSL

**FoodMood**

**2020**

- Successful final round application submission to Capital One's Software Engineering Summit
- Utilized Bootstrap, Esri's ArcGIS API, HTML5 Geolocation, and the Yelp API

**Cleversign: A Real-Time American Sign Language Interpreter**

**2018**

- Built a classifier that outputs English letters given visual webcam input of ASL hand signs
- Retrained Google's Inception-V3 convolutional neural network (CNN) using TensorFlow
- Utilized OpenCV for image preprocessing, i.e. isolating the hand's shape in each frame

## POSTERS

**Studies Towards a Novel Synthesis of Indoles with Concurrent Group Migration**

**2017**

- Poster based upon work done as an intern at Boston University during the summer of 2017
- Presented at Poster Symposium for BU's Research in Science & Engineering (RISE) program

## AWARDS

**Fellow** – Rewriting the Code

**Aug 2020 – Aug 2021**

## SKILLS

Laboratory: H-NMR, C-NMR, IR, UPLC-MS, GC-MS, GPC

Computer: C, SML, Java, Python, LaTeX, HTML/CSS, JavaScript, TensorFlow, OpenCV

Language: Fluent in English and Chinese, conversant in Spanish

Other: photography, digital media editing

## MUSIC

### PROFESSIONAL EXPERIENCE

**Rehearsal Pianist** – CMU School of Music, Pittsburgh, PA

**Nov 2019 – Apr 2020**

- Played for coachings, staging rehearsals, and tech runs of *The Light in the Piazza* (January 2020) and *The Turn of the Screw* (April 2020)

**Resident Artist Pianist** – Pittsburgh Festival Opera, Pittsburgh, PA

**Jun 2019 – Jul 2019**

- Assisted the music direction of multiple new works, including *Mr. Rogers' Operas*
- Contributed to MainStage programming and sound engineering logistics
- Played for coachings, recitals, and cabarets in the Young Professional Artists Program

### PRODUCTIONS

#### Opera

<i>Life Feels Right</i> <sup>3</sup>	Show & Rehearsal Pianist	CMU School of Music	2020
<i>The Turn of the Screw</i>	Rehearsal Pianist	CMU School of Music	2020
<i>Virgula Divina</i> <sup>1</sup>	Conductor/Pianist	Pittsburgh Festival Opera	2019
<i>Night Flight of Minerva's Owl</i> <sup>1</sup>	Show & Rehearsal Pianist	Pittsburgh Festival Opera	2019
<i>Die Liebe der Danae</i>	Show Pianist	Pittsburgh Festival Opera	2019
<i>Mister Rogers' Operas</i>	Assistant MD/Pianist	Pittsburgh Festival Opera	2019

#### Musical Theatre

<i>Lone Wolf Pack</i>			
<i>Side by Side by Side</i> <sup>1</sup>	Music Director/Pianist	Scotch'n'Soda Theatre	2020
<i>This Side Up</i> <sup>1, 3</sup>	Show & Rehearsal Pianist	CMU School of Music	2020
<i>The Light in the Piazza</i>	Rehearsal Pianist	CMU School of Music	2020
<i>Birds &amp; Beansprouts</i> <sup>2, 3</sup>	Show & Rehearsal Pianist	CMU School of Drama	2019
<i>Catch Me If You Can</i>	Show Pianist	Scotch'n'Soda Theatre	2019
<i>High School Choosical</i> <sup>2, 3</sup>	Show & Rehearsal Pianist	New Works Coffeehouse	2019
<i>Miscast Cabaret</i>	Show & Rehearsal Pianist	Scotch'n'Soda Theatre	2019
<i>MAMMA MIA!</i>	Music Director/Pianist	Scotch'n'Soda Theatre	2019
<i>Sweeney Todd</i>	Rehearsal Pianist	Scotch'n'Soda Theatre	2018
<i>11<sup>th</sup> Annual Benefit Cabaret</i>	Show & Rehearsal Pianist	Scotch'n'Soda Theatre	2018
<i>Mary Poppins</i>	Show & Rehearsal Pianist	TJHSST Drama	2018

<sup>1</sup> scenes/excerpts of full work

<sup>2</sup> staged reading

<sup>3</sup> student-written new work

### EDUCATION

**Carnegie Mellon University**

**Pittsburgh, PA**

Minor in Collaborative Piano

May 2022

Relevant coursework:

- Collaborative Piano (playing for studio voice lessons and coachings)
- English/Contemporary Literature and Repertoire
- French Diction

### SKILLS

Instruments: piano, violin, mallet percussion

Technical: MainStage 3, GarageBand, Dorico 3

### RECITALS

**Carnegie Mellon University School of Music**

- Joe Brauch's Junior Composition Recital (2019). Performed his solo *Piano Sonata No. 1* and played in his chamber ensemble piece *Mischief Night*.

- Jieying Zhang's Master's Recital (2019). Accompanied a lecture-style recital given in fulfillment of her music education degree.
- Freshman Showcase (2019). Performed in Joshua Gregg Fried's *where the sidewalk ends* and Matthew Zwiebel's *SEA* (on violin).
- Pierre Vallet's Masterclass (2019). Served as an alternate pianist.
- Virtual Student Composer's Concert (2020). Performed in Joshua Gregg Fried's *UNDER CONTROL* and Ian Kaneko's *The Soul has Bandaged Moments*.

## EXTRACURRICULAR ACTIVITIES

**Secretary, Music Director, Rehearsal Pianist** – Scotch'n'Soda Theatre

**Member** – Sigma Alpha Iota, Alpha Mu Chapter

## REFERENCES

References available upon request.