

# 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 QPA: 4.00

Relevant courses: Honors Chemistry, Inorganic Chemistry, Modern Organic Chemistry  
Concepts of Mathematics, Matrices and Linear Transformations  
Probability, Great Ideas in Theoretical Computer Science  
Principles of Imperative Computation, Introduction to Computer Systems

#### **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

#### **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 pedagogy 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 along with the other TAs

**LEADERSHIP****Secretary, Board of Directors – Scotch'n'Soda Theatre, Pittsburgh, PA May 2019 – Apr 2020**

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

**PROJECTS****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

**SKILLS**Laboratory: H-NMR, C-NMR, IR, UPLC-MS, GC-MS, GPCComputer: C, Java, Python, Mathematica, LaTeX, HTML/CSS, JavaScript, TensorFlow, OpenCVLanguage: Fluent in English and Chinese, conversant in SpanishOther: photography, digital media editing**EXTRACURRICULAR ACTIVITIES****Carnegie Mellon Informatics and Mathematics Competition Organizing Team – Logistics Officer****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

**EDUCATION****Carnegie Mellon University**

Minor in Collaborative Piano

**Pittsburgh, PA**

May 2022

Relevant coursework:

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

**EXTRACURRICULAR ACTIVITIES****Scotch'n'Soda Theatre – Secretary, Music Director, Rehearsal Pianist****Carnegie Mellon University School of Music – Rehearsal Pianist**

## PRODUCTIONS

### Opera

<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

<a href="#"><i>This Side Up</i></a> <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

## SKILLS

Instruments: piano, violin, mallet percussion

Technical: MainStage 3, 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.

## REFERENCES

References available upon request.