Runyu Qi

Email: runyuq2@illinois.edu
Homepage: https://me.sam7.xyz

EDUCATION

University of Illinois Urbana-Champaign *Illinois, United States* *Aug.2023 - Present*

- M.S. in Material Science and Engineering

Tsinghua University *Beijing, China* *Sept.2019 - Jun.2023*

- B.E. in Material Science and Engineering

RESEARCH EXPERIENCES

Surface-Enhanced Raman Spectroscopy and Electrochemical Detection of Energetic Materials

Advisor: Prof. Yunhan Ling(Tsinghua Univ.) *Bachelor Thesis* *Feb.2023 - Jun.2023*

- Developed sensors with SERS and electrochemical detection performance by preparing nanogold SERS substrates, modifying their surfaces, and characterizing their performance.
- Achieved quantitative detection of methylene blue and perchlorate with low minimum quantification limits.
- Developed a TNT molecularly imprinted polymer electrode and achieved detection with low minimum detection limits.

Nano ZrO_2 Reinforced Dental PMMA-Based Resin for Stereolithography Additive Manufacturing

Advisor: Dr. Tao Lin(Tsinghua Univ.) *Enterprise Project* *Oct.2022 - Dec.2022*

- Conducted experiments to modify the surface of nano ZrO_2 and resin compounds, with the goal of developing a biocompatible resin with high strength and modulus.
- Formulated a high-precision resin for restorative dental models, utilized a DLP 3D printer to fabricate human teeth models, and analyzed the reinforcing mechanism via SEM.

A Review on PDMS-based Electronic Skin and Self-healing Property

Advisor: Prof. Lilian Hsiao(NC State) *Virtual Research Program* *Jul.2022 - Aug.2022*

- Conducted a thorough literature review on PDMS and e-skins by analyzing 10+ research papers, then synthesized the findings into an academic poster. Collaborated with a professor and Ph.D. candidate to incorporate feedback, and delivered a successful video presentation.
- Developed skills in conducting comprehensive English literature reviews, creating academic posters, and delivering presentations. Achieved a top grade in the final evaluations for a project involving PDMS and e-skins.

Finite Element Method (FEM) Simulation of Autoclave and Development of Scripts & Extensions

Independent Research *Competition Program* *Apr.2022 - Jun.2022*

- Conducted a two-month project involving industry research, software training, and modeling, calculation, and simulation.
- Developed Python automation scripts and graphical extensions to streamline the modeling process, resulting in time and cost savings.
- Presented the project with video examples and won second prize in a competition.

3D Printing of Glass Fiber Reinforced Plastic by Stereolithography
Advisor: Dr. Rongxuan Liu(Tsinghua Univ.) *Student Research Training Sept.2021 - Jan.2022*

- Conducted research on methods for enhancing 3D-printed workpiece strength with continuous fiber composites, through reading articles and investigating business solutions.
- Reproduced experiments using various materials and devices, and improved methods and process parameters based on the results. Analyzed the tensile break mechanisms using section SEM.
- Conducted over 20 controlled trials, achieving a two-fold increase in tensile strength without sacrificing quality. Manufactured workpieces using a desktop LCD 3D printer.

Development of Metallic Glass Full-spectrum Visible-light Filter
Advisor: Prof. Na Chen(Tsinghua Univ.) *Student Research Training Dec.2020 - Sept.2021*

- Acquired expertise in magnetron sputtering to deposit amorphous alloy films onto silicon/silicon oxide and titanium alloy surfaces.
- Fabricated high hardness and high-transmittance metallic glass films, modifying their optical properties by manipulating oxygen.
- Developed an effective adhesion method, which was applied to product surfaces to create films with high hardness, wear resistance, and color.

PVDF based piezoelectric composites
Advisor: Prof. Yang Shen(Tsinghua Univ.) *Research Assistant Nov.2020 - Sept.2021*

- Provided assistance to a Ph.D. candidate by preparing solutions and PVDF precursor, preparing foam ceramic bodies, and cleaning experimental instruments.
- Attended group meetings to gain familiarity with research methods and processes, and to stay informed about the latest developments in the field.

AWARDS

The Tsinghua Univ. Technological Innovation Scholarship *2022*
The second prize, 3^{rd} Virtual Simulation Creative Design Competition *2022*
The first prize, 5^{th} Tsinghua Univ. 3D Printing Skills Competition *2021*
The Tsinghua Univ. Excellent Art Scholarship *2021*
The second prize, 4^{th} Tsinghua Univ. 3D Printing Skills Competition *2020*

ACTIVITIES

Captain, Student Network Service Work-study Team, Tsinghua Univ. *Mar.2021 - Jun.2023*

- Coordinated a team of student workers responsible for IT services center support for faculty, staff, and students.

- Managed official accounts and team websites to ensure effective communication and timely updates.
- Provided technical assistance with PC issues and contributed to network operation and maintenance of campus buildings.

President, Future Sci-tech interests Club, Tsinghua Univ. *Sept.2022 - Jun.2023*

- Managed GPU servers and organized activities for the club, fostering a community of technology enthusiasts.
- Facilitated communication with industry professionals, including HR representatives from companies, to provide club members with opportunities to network and learn about careers in science and technology.
- Led a program to develop a low-power, portable network monitoring device using Python, which visualized signals and monitored connection status.

Volunteer, Olympic and Paralympic Winter Games, Beijing *Feb. 2022 - Mar. 2022*

- Served as an Event Services volunteer at the Beijing National Stadium (Bird's Nest) during the Games' opening and closing ceremonies.
- Provided guidance to spectators on the stands and conducted ticket checks in the corridor, ensuring a safe and enjoyable experience for all attendees.