

# Chixin (Tracy) Zhang

## Contact

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## Education

Carnegie Mellon University  
BS - Chemistry  
BA - Architecture  
2021 - Dec 2024

Rhode Island School of Design  
Pre-College: Industrial Design  
Summer 2019

## Skills

Rhino  
AutoCAD  
Ansys  
Grasshopper  
Illustrator  
Photoshop  
InDesign  
V-ray  
Figma  
KeyShot  
Escape

## Architecture

Laser Cutter  
3D Printer (FDM)  
Woodworking  
Sewing Machine  
Embroidery Machine  
CNC Machine  
Weaving,  
Printmaking  
Design electronic sensor

## Chemistry

XRD, XRF  
UV-Vis  
H-NMR, C-NMR  
IR, FTIR  
CD, CV  
SEM, Microscope  
GPC  
Column Chromatography  
HPLC  
Ion Chromatography  
GCMS, ESI  
Glove box (inert)  
PCR

## Language

Rheometer  
Tensile Testing  
Embedding Textile  
Glass Fiber Spinning line  
Melt Spinning Line  
English (Native)  
Mandarin (Native)  
Japanese (conversational)  
Python  
Processing

## Professional Experience

### Noonan Lab

*Polymer Research Assistant; P.I Dr. Kevin J.T. Noonan*

Jan 2023 –

/Devised a synthetic scheme for conjugated helical polyfuran and two group 16-based macrocycles, improving yield by 40% through Suzuki and Negishi Coupling. Optimized electronic, photophysical, and fluorescent properties of macrocycles (close ended conjugated polymer) through computational studies and synthetic design. Explored novel heterocycle transformations for conjugated macrocycles. Presented research findings at group meetings and fellowship discussions.

Pittsburgh, PA

### RWTH Aachen Institute of Textile Technology

*R&D Researcher; P.I Dr. Thomas Gries*

May 2024 – Aug 2024

Led the "Circwool" project, developing innovative recycling technology for wool waste and optimizing keratin extraction to replace petroleum-based feedstock. Improved fiber strength by 20% through keratin sizing in glass fiber production and created biodegradable films by adjusting protein structures. Scaled the process from laboratory to pilot stage while collaborating with Ortovox, Biotextfuture, and a multidisciplinary team to drive innovative applications.

Aachen, Germany

### Robotics Institute - Textile Lab

*Design Reseracher; Mentor Yuichi Hirose*

Oct 2022 – May 2024

/Contributed to the development of an cutting-edge 3D solid knitting machine, using CAD for iterative prototyping within an advanced additive manufacturing framework. Engineered Python-based software to optimize knitting geometries and improve system performance. Led the design optimization of the machine and its yarn feeding components, advancing textile manufacturing technologies. Explored new applications of these techniques for large-scale construction projects.

Pittsburgh, PA

### Huang Research Academy

*Lab Assistant + Conservation Intern; P.I. WenYuan Zhang, Tao Yang*

Summer 2023

/Scientifically conserved UNESCO World Heritage sites, including Mogao, Maijishan, and Yulin Grottoes. Conducted pest control to protect endangered artifacts. Analyzed pigments, soil, and earthen layers to identify deterioration and develop conservation strategies. Refined reinforcement techniques to preserve ruin soil through material characterization and enhanced adhesive properties of wall paintings by synthesizing modified gelatin substrates.

Dunhuang, China

## Project

### Study and Conservation of the CMOA Hall of Architecture cast collection

2024-

/A comprehensive study of the 19-century plaster cast through historical inquiry, documentation, scientific examination, and narrative crafting to contextualize these large-scale three-dimensional objects for the archival and a better developed conservation treatment plan for 2028. Cataloged and organized historical documents and artifacts, ensuring accurate metadata for future references. Managed and updating archival databases, ensuring all records are up-to-date and easily accessible through Excel.

### Organogel based sensor

2024

/Through the synthesis of a self-healing, conductive and low young's modulus organogel species with PVA, borax and liquid metal matrix, we proposed the fabrication of a bio-compatible bandage leveraging the tissue like property of that organelle for medical sensing.

## Publication

Work-In-Progress Journal Paper

[W1] Sharma D.; Zhang, C.X.; Noonan, K.J. T., "Breaking the Symmetry: Turning on the fluorescence for Cyclo[6]Furan"