Yangruirui ZHOU

Email: yrrzhou@bu.edu Tel: (+1) 857-763-9402 Webpage: zyrrron.github.io

EDUCATION

Boston University, Boston, MA 09/2020-Now
Doctor of Philosophy (Ph.D.) candidate in Computer Engineering
GPA: 3.91/4.00
Advisor: Douglas Densmore
Research Focus: Microfluidic CAD tools and algorithms in synthetic biology applications.

University of Electronic Science and Technology of China (UESTC), Chengdu, China 09/2016-06/2020
Bachelor of Engineering in Software Engineering *(Elite program)*
GPA: 3.94/4.00 (Rank: 6/740)
Thesis: Analysis of Postoperative Applications of Pose Tracking Algorithms.

RESEARCH EXPERIENCE

Boston University, Boston, MA 07/2020-Now
Research Assistant, **CIDAR lab (**Supervisor: Prof. **Douglas Densmore**)

Massachusetts Institute of Technology, Boston, MA 11/2022-Now
Collaborative Research Assistant, **Voigt lab (**Supervisor: Prof. **Christopher Voigt**)

The Chinese University of Hong Kong, Hong Kong, China 03/2023-Now
Collaborative Research Assistant, **Ho lab (**Supervisor: Prof. **Tsung-Yi Ho**)

University of California, Santa Barbara, CA 06-08/2019
Student Research Internship, **Four eye's lab (**Supervisor: Prof. **Matthew Turk** and Prof. **Tobias Höllerer**)

AWARDS & HONORS

iGEM "**Gold medal**" (Student Mentor, wiki: https://2024.igem.wiki/bostonu/) 11/2024
China Youth Science and Technology Innovation Award (Nominated by UESTC) 05/2020
Most Outstanding Students of UESTC 2019 (成电杰出学生, **10/5000** in UESTC, **1/740** in department) 12/2019
iGEM "**Gold medal**" and "**Best Software Project**" (wiki: https://2019.igem.org/Team:UESTC-Software) 11/2019
Outstanding Graduates Award of UESTC 10/2019
"Wu Liang Ye" Enterprise Scholarship (**2/740** in Software Engineering department) 09/2019

PROFESSIONAL SERVICES

Patent of Agricultural Heavy Metal Biosensor-Integrated Device 05-11/2024
Student Mentor of iGEM team: BostonU 04-10/2024
Teaching Assistant of EC504 (Advanced data structure and algorithms) 01-05/2022, 01-05/2023
ICCAD'22 Paper Reviewer 06/2022

PROFESSIONAL ACTIVITIES

International Workshop on Bio-Design Automation (IWBDA'25, talk presentation) 09/2025
International Genetically Engineered Machine competition (iGEM'19, iGEM'24) 11/2019, 11/2024
Chicago BioEngineering Conference (CBEC'24) 09/2024
Engineering Biology Research Consortium (EBRC'23) 06/2023
International Workshop on Bio-Design Automation (IWBDA'22, poster presentation) 10/2022

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SKILLS

Programming language: Python, Java, C/C++, Typescript, HTML, Linux Shell.
Tools: NetworkX, Tensorflow, Pytorch, Latex, Fusion 360.
Manufacturing (microfluidics): CNC Milling, Laser Cutting.

RESEARCH INTERESTS

[1] Development of graph-based algorithms for synthetic biology applications
[2] Design and optimization of computer-aided design (CAD) tools for microfluidic laboratory automation
[3] Application of AI models to enable a fully automated and integrated ecosystem for microfluidic laboratory operations

MENTORSHIP

EBRC Mentorship for Undergraduate and Masters Students Program (EMUMS) 04/2025-Now
Eric Xie, Undergraduate research assistant in CIDAR lab 06/2023-Now
Student mentor (software) for iGEM team of Bonston University in 2024 04-10/2024

PROFESSIONAL SOCIETIES

Institute of Electrical and Electronics Engineers (IEEE, graduate student membership) 02/2024-Now

JOURNAL REVIEWER

IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (IEEE-TCAD), eLife

PUBLICATIONS

Google Scholar (https://scholar.google.com/citations?user=Zel-iSQAAAAJ&hl=en)

[**C1**, IWBDA'22] A Conceptual Interactive Microfluidic Design and Control Workflow 07-08/2022

[**J1**, IEEE-TCAD] **Zhou, Y.**, Oliveira, S. M., Sanka, R., McIntyre, D., & Densmore, D. (2024). Vespa: Logic-Level Constraint-Based Validation for Continuous-Flow Microfluidic Devices. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*. (doi: 10.1109/TCAD.2024.3435706) 09/2021-02/2024

[**J2**, Nature Chemical Biology] Padmakumar, J. P., Sun, J. J., Cho, W., **Zhou, Y.**, Krenz, C., Han, W. Z., ... & Voigt, C. A. (2024). Partitioning of a 2-bit hash function across 66 communicating cells. *Nature Chemical Biology*, *21*(2), 268-279. (doi: 10.1038/s41589-024-01730-1) 04/2022-12/2023

[**J3**, IEEE-TCBB] **Zhou, Y.**, Voigt, C. A., & Densmore, D. (2025). Constraint-Based Sub-Graph Partitioning for Multi-Cellular Biological Networks. *IEEE Transactions on Computational Biology and Bioinformatics*. (doi: 10.1109/TCBBIO.2025.3575288) 02/2023-08/2024

[**C2**, IWBDA'25] LaNVis: Biological Constraint-based Large Network Visualizer 09/2024-08/2025

[**J4**, in progress, targeting Nature Computational Science] *Neptune: Web-based Automated Design and Synthesis Platform for Microfluidic Devices.* The platform defines a formal design grammar that can be learned by large language models (LLMs), enabling direct natural-language-based design generation and agent-driven automation. 04/2023-Now