SETTHIBHAK SUTHITHANAKOM

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Online Portfolio: https://setthibhak.github.io/

EDUCATION

Imperial College London — London, UK
Master of Research (MRes), **Distinction**, Bioengineering — 2022

Chulalongkorn University — Bangkok, Thailand
B.E., **Second Class Honors**, Mechanical Engineering — 2021

University of British Columbia — Vancouver, BC, Canada
Summer Program, Data Science Application in the Medical Science and System Pathophysiology — 2019

RESEARCH EXPERIENCE

Department of Mechanical Engineering, Chulalongkorn University — Bangkok, Thailand
Research Assistant with Dr. Ratchatin Chancharoen — 2022-present
Funded by the National Research Council of Thailand (NRCT)

- Introduced the high visibility extruder with intrinsic sensing ability for real-time monitoring of printing pressure, volumetric flow, and material properties during 3D printing
- Devised a novel hybrid pressure/volumetric-controlled extrusion scheme for the precise 3D printing of viscoelastic material
- Designed the universal magnetic interface system for printheads to facilitate multi-process fabrication

Department of Bioengineering, Imperial College London — London, UK
Graduate Student with Dr. Christopher Rowlands — 2021-2022

- Proposed an innovative reconfigurable microfluidic device for drug synthesis, leveraging an array of microvalves to redefine flow paths and implement peristaltic fluid transport
- Established the scalable, low-latency, and individually controllable microvalve design

Veterinary Clinical Stem Cells and Bioengineering Research Unit, Chulalongkorn University — Bangkok, Thailand
Intern with Dr. Teerawat Tarasanit — Summer 2020

- Engineered a cost-effective bioreactor for mammalian cell culture
- Conducted an analysis of local shear stress applied to cells using Computational Fluid Dynamics (CFD)

Department of Mechanical Engineering, Chulalongkorn University — Bangkok, Thailand
Undergraduate Researcher with Dr. Ratchatin Chancharoen — 2019-2021

- Developed a temperature-controlled system for the 3D printing of hydrogel by implementing extruder heating and print bed cooling
- Fabricated syringe-based positive displacement printhead for 3D printing of various soft matters including silicone, food paste, and biogel
- Operated and modified commercial 3D bioprinter for the printing of mammalian cell-ladened hydrogel

PUBLICATIONS

S. Suthithanakom, C. Sithiwichankit, K. Chaiprabha, and R. Chancharoen, "Flexible Actuation with Intrinsic Sensing for Ram Extrusion 3D Printing", under review.

S. Suthithanakom, S. Juemjutitam, N. Arunwattanamongkol, T. Wongpakham, A. Pimpin, and R. Chancharoen, "Temperature Control for Hydrogel Bio-Printing" in *2019 IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and IEEE Conference on Robotics, Automation and Mechatronics (RAM)*, IEEE, Nov. 2019, pp. 310–315. doi: 10.1109/CIS-RAM47153.2019.9095808.

TALKS AND PRESENTATIONS

SCG Packaging Public Company Limited Bangkok, Thailand
Invited Talk: 3D Printing Technology Overview and Soft Matter 3D Printing (scheduled) Nov 2023

International School of Engineering (ISE), Chulalongkorn University Bangkok, Thailand
Guest Lecturer, Introduction to Industrial Sensors Feb 2023
Guest Lecturer, Machine Vision Workshop Feb 2023

9th IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and IEEE Conference on Robotics, Automation and Mechatronics (RAM) Bangkok, Thailand
Conference Presentation, Temperature Control for Hydrogel Bio-Printing Nov 2019

RELATED PROFESSIONAL EXPERIENCE

Digitech Fabrication Co., Ltd. Bangkok, Thailand
Co-founder 2023-present

- Co-founded a company specializing in digital fabrication services, with a primary focus on 3D printing functional engineering parts tailored for engineering education.
- Led the design, optimization, and oversight of the 3D printing process in the production plant.

SKILLS

- Intensively experienced with Direct Ink Writing (DIW) of soft matter, especially biogels
- 3D Printing technology proficiency (FDM, MSLA, SLA)
- Rapid prototyping
- Advanced Computer-Aided Design (Fusion360, AutoCAD)
- Customized Printed Circuit Board (PCB) design for production
- Microcontroller programming (C, C++)
- Statistical and mathematical analysis (Python, R, MATLAB)
- Mechanical, thermal, and fluid dynamics simulation (COMSOL Multiphysics, MATLAB)
- Machine and mechanical tools operation (CNC, Laser Cutting, Latching, Welding)
- Mammalian Cell Culture

REFERENCES

Ratchatin Chancharoen, Ph.D.
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