Dapeng WANG (Phoenix)

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EDUCATION

UNIVERSITY OF MICHIGAN

Master of Science in Engineering of Mechanical Engineering
Ann Arbor, Michigan, USA August 2024 – present

- Cumulative GPA: 3.895/4.0

THE HONG KONG POLYTECHNIC UNIVERSITY

Bachelor of Engineering (Honors) in Mechanical Engineering
Hong Kong, China September 2020 – July 2024

- GPA: 3.80/4.3 (3.70/4.0 from WES calculation) (First Class Honor, Top 4%)
- Major GPA in Mechanical Engineering: 3.87/4.3
- Dean's Honors List 2021/22, 2022/23 (Top 10%)
- The Hong Kong Polytechnic University Scholarship 2023/24 ($40,000 HKD)

Skills:

Coding:
Python, C/C++, MATLAB, JavaScript & HTML

Robotics & AI:
Dynamics Modeling, Embedded system development (Arduino, Raspberry Pi), Machine Learning, and Deep Learning (PyTorch), OpenCV, PCB design (JLC & Eagle)

Mechanical Engineering:
Quick prototyping, CAD/CFD, 3D printing (Bambu, formlab), Sheet metal manufacturing, PCB milling

Language: English (Professional Communication, TOEFL: 104/120) / Mandarin (Native speaker)

RESEARCH EXPERIENCE (SELELCTED)

RESEARCH & ENGINEERING ASSISTANT OF OSCILLATING SWARM ROBOT

Tile: *Master research assistant*
Ann Arbor, Michigan, USA June 01, 2025 – Present

- **First author** of the **going to be submitted Journal Paper**, **'Oscillating Eel Robots that Leverage Collisions for Controllable Motions'** of IEEE Robotics and Automation Letter (RA-L) .
- Continued work from EEL-inspired robot project.
- Major roles:
  1. Designed and developed the mechanical design the Oscillating Eel Robot swarm.
  2. Implementing Central Pattern Generator (CPG) and physical synchronization to achieve non explicit model-based control of active matter swarm robots.
  3. Design and conduct experiments.
  4. Build dynamics model for validating control principles.
  5. Process experiment data.
  6. Paper writing.

RESEARCH & ENGINEERING ASSISTANT OF SMARTICLE ROBOT PROJECT (INDEPENDENT RESEARCH PROJECT)

Tile: *Master research assistant*
Ann Arbor, Michigan, USA March 01,2025 – Present

- Being research & engineering assistant of a smartice robot project supervised by Prof. Steven. Ceron from Michigan Robotics, University of Michigan
- Major roles:
  1. Designed the mechanical structure of smarticle robot's motor modular structures based on the principles of dynamics transmission through SolidWorks.
  2. Developed embedded system using OpenRB-150 controller and DYNAMIXEL XL330-M288-T servo motor.
  3. Developed basic control algorithm through C/C++ in Arduino IDE
  4. Designed and Developed Printed Circuit Board (PCB) for photoresistor sensors on the robot.

RESEARCH & ENGINEERING ASSISTANT OF EEL-INSPIRED ROBOT PROJECT (INDEPENDENT RESEARCH PROJECT)

Tile: *Master research assistant*

Ann Arbor, Michigan, USA — Jan 08,2025 – May 12, 2025

- Being research & engineering assistant of a eel-inspired underwater robot project supervised by Prof. Steven. Ceron from Michigan Robotics, University of Michigan
- Major roles:
  1. Designed the mechanical structure of eel robot's motor modular structures based on the principles of dynamics transmission and waterproof through SolidWorks.
  2. Developed embedded system using OpenRB-150 controller and DYNAMIXEL XL330-M288-T servo motor.
  3. Developed Central Pattern Generator (CPG) control algorithm through C/C++ in Arduino IDE for each EEL robot.
  4. Developed Simulation of EEL robots through MATLAB and Pygame & Pymunk with Python
  5. Developed experiment setting for data collection through OpenCV.

RESEARCH & ENGINEERING ASSISTANT OF A NERUO-BEHAVIOR PROJECT

Tile: *Master research assistant*

Ann Arbor, Michigan, USA — September 04,2024 – April 08, 2025

- Being research & engineering assistant of a neuro-behavior project supervised by Prof. Talia. Y. Moore from Michigan Robotics, University of Michigan
- Major roles:
  1. Developed embedded system using Raspberry Pi for data collection and analysis based on 'evtest' package in Ubuntu 24.04.
  2. Processed and analyzed experiment data through Computer Vision (CV) in Python.
  3. Help building experiment setting consists of Raspberry Pi and camera.
  4. Build codes through Colab and OpenCV to help the team collect the video data automatically.

DESIGN & DEVELOPMENT OF ROBOTIC FISH (CAPSTONE PROJECT)

Title: Final year project student

Hong Kong, China — September 01,2023 – May 13, 2024

- Design and develop a robotics fish under the supervision of Prof. Hui Tang.
- Roles in project team:
  1. Built dynamics model of fish tail, and lifting & diving mechanisms.
  2. Built Kalman Filter for fish velocity and altitude control.
  3. Processed sensors signal with Simulink.
  4. CAD design & Manufacturing.
- This project received A+ as final grade (10% A+ rate).

STUDENT RESEARCH ASSISTANT IN RENEWABLE ENERGY ADVANCEMENT LAB

Title: Research Assistant

Hong Kong, China — October 03, 2023 – August 26, 2024

- **First author** of the Journal Paper, '**Efficient estimation of convective cooling of photovoltaic arrays: A physics-informed machine learning approach'** of Energy & AI (IF: 9.8).
- Conduct research on the continued work of PIML-DCNN model on quantify staggered-height configurations on convective heat transfer of PV arrays from Undergraduate Research and Innovation Scheme (URIS) under the supervision of Prof. Mengying Li.
- Major roles:
  1. Designed and built Physics Informed Machine Learning (PIML) and Deep Convolution Neural Network (DCNN) model.
  2. Designed and built Computational Fluid Dynamics (CFD) models through COMSOL and MATLAB.
  3. Helping the Lab apply for hyper computation platform of The Hong Kong Polytechnic University.

STUDENT RESEARCH ASSISTANT IN ROBOTICS AND MACHINE INTELLIGENCE LAB

Title: Research Assistant

Hong Kong, China — September 1, 2022 - July 28, 2023

- Acting as manufacturing assistance on a desalination robotics project belonging to a joint project between PolyU and Hohai University named 'Collaborative development of automated photovoltaic-integrated salt production technology' under the supervision of Prof. David NAVARRO ALARCON.
- Roles:
  1. Assisted in designing, manufacturing, and building robotics vehicles platform through CAD/CAE in Solidworks

2. Helping researching team build the connection between lab in Hong Kong, China and manufacturers in Shenzhen, China.

UNDERGRADUATE RESEARCH AND INNOVATION SCHEME (URIS)

Title: Undergraduate Researcher in scheme

Hong Kong, China June 07, 2022 – August 31, 2023

- Conduct research on the convective heat transfer effect of staggered-height arrangement on PV farms under the supervision of Prof. Mengying Li.
- Roles:
  1. Designed and built CFD model through COMSOL and MATLAB.
  2. Proposed Physics-Informed Machine Learning and Deep Convolution Neural Network combined model (PIML-DCNN) model to quantifying Convective Heat Transfer Coefficients (CHTC) of PV array with staggered-height configurations.
- Submitted a conference paper, "Efficiency improvement of solar Photovoltaic arrays using height-staggered configurations", to PolyU Research Student Conference (PRSC 2023), and the abstract has been accepted.

STUDENT RESEARCH ASSISTANT IN RENEWABLE ENERGY ADVANCEMENT LAB

Title: Undergraduate Research Assistant

Hong Kong, China Jan 24 - April 29, 2022

- Conduct research on adaptive cooling method combining radiative and convective heat transfer of photovoltaic panels under the supervision of Prof. Mengying LI.
- Roles:
  1. Designed and built the flapping-wing cool device prototype through CAD/CAE in Solidworks.
  2. Built the control system through Arduino, stepper, electromagnetic actuator, and thermal coupler sensor.
  3. Built the data collection system based on the port communication between Arduino & laptop through python coding.
  4. Conduct indoor & outdoor environments.

EXTRA-CURRICULAR ACTIVITIES (SELECTED)

RS INNOVATORS CHAMPIONSHIP 2023

Hong Kong, China

Team leader & AI model designer of team EA Dynamics November 30, 2022 – April 05, 2023

- Lead team named EA Dynamics joined RS Innovators Championship 2023.
- Roles:
  1. Proposed a mode based on LSTM to provide new strategy of logistics arrangement based on logistics data, improving distribute center working efficiency.
  2. Team leader.
- Lead the team become 10 finalist teams worldwide and joined the final round the worldwide competition.

SELECTED AWARDS

THE HONG KONG POLYTECHNIC UNIVERSITY SCHOLARSHIP 2023/24 ($40,000 HKD AWARD)

FIRST CLASS HONOR (GRADUATION HONOR)

10 FINALIST TEAM RS INNOVATORS CHAMPIONSHIP 2023

DR. WINNIE S M TANG- POLYU STUDENT INNOVATION & ENTREPRENEURSHIP SCHOLARSHIP ($15,000 HKD TEAM AWARD)

PROFESSOR LEUNG TIN-PUI MEMORIAL SCHOLARSHIP ($20,000 HKD AWARD)