Haoran Hou

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EDUCATION

Imperial College London   *09/2023-09/2024*

➢ **Major**: Human and Biological Robotics (MSc, Merit)

➢ **Main Courses**: Systems Physiology | Brain Machine Interfaces | Image Processing | Reinforcement Learning | Statistics and Data Analysis | Robotics | Bioinspired Robots | Application Specific Integrated Circuits | Human Neuromechanical Control and Learning

University of Oxford   *01/2023-03/2023*

➢ **Major**: Artificial Intelligence and Machine Learning

➢ A Joint School Programme with Tianjin University

Tianjin University   *09/2019-06/2023*

➢ **Major**: Electronic Information Engineering (B.Eng, GPA: 87.96/100, Top 20%)

➢ **Main Courses**: Machine Learning and Visual Perception | Deep Learning | Statistics and Data Analysis | Pattern Recognition and Brain-Insipired Intelligence | Digital Image Processing | Automatic Control | Electronic Circuit | Electronic System Design | Wireless Sensor Network Technology

RESEARCH PROJECTS

Machine Learning for 3D Segmentation of Large Datasets to Detect Normal and Pathological Hearts
Imperial College London   *01/2024-09/2024*

➢ Data source: 48 hpf zebrafish heart 2D slices (20 GB).

➢ Imaging method: Light-Sheet Fluorescence Microscope.

➢ 4D Reconstruction: heartbeat cycle detection, spatial alignment, temporal alignment, and resampling.

➢ 3D Segmentation: propose 2 backbones (3D U-KANs and 3D ResNet50 Encoder) innovately.

➢ Tracking and single cell analysis using segmentation results.

Multimodal Model for Esophageal Cancer Diagnosis
Chinese University of Hong Kong   *06/2024-09/2024*

➢ Datasets: CT images and unstructured text of esophageal tissues.

➢ Develop a multimodal model for segmentation and diagnosis of esophageal cancer lesions.

➢ Use NLP to embed esophageal cancer text information into the segmentation network through CLIP model.

➢ Transfer the model to use in lung cancer diagnosis.

Development of Biochips for Genetic Diagnosis
University of Hong Kong   *02/2024-05/2024*

➢ FPGA-based processors: accelerate bioinformatics computing.

➢ Real-time CRISPR technology: simultaneous detection of multiple genes.

➢ Microfluidics technology: rapid identification and editing of target genes.

➢ Machine learning algorithms: identify and classify complex image data from biochips.

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Development of Robotic Arm to Assist Upper Limb Rehabilitation

Chinese Academy of Sciences   *05/2022-11/2022*

➢ Paper: *Design and simulation of an upper limb rehabilitation exoskeleton robot* (doi:10.1145/3548608.3559175)

➢ Analyze dynamics and kinematics to design a reasonable exoskeleton robot structure.

➢ Analyze the structure and joint motion of the human arm to plan the trajectory of the robot arm.

➢ Use impedance control to optimize the control system.

Development of Intelligent Crutch Based on STM 32

Innovation & Entrepreneurship Training Program for College Students   *05/2022-06/2023*

➢ Develop a smart crutch using artificial intelligence and embedded systems.

➢ Add functions such as GPS, ultrasonic obstacle avoidance and fall detection to traditional crutches.

➢ Provide real-time communication, seamless integration, data exchange, instant access to user information.

INTERNSHIP

Huatai Securities

Position: Wealth Center Intern   *08/2023-09/2023*

➢ Analyze stock market trends, client investment portfolios, etc.

➢ Use data models to predict market trends, and turn it into useful investment strategies.

China Pacific Life Insurance Co., Ltd.

Position: Account Manager Intern   *07/2023-08/2023*

➢ Collecte, analyze, and interpret customer data.

➢ Craft superior marketing strategies and service programs using data.

CERTIFICATE (COURSERA)

➢ DevOps, DataOps, MLOps   *Duke University*

➢ Database Design and Basic SQL in PostgreSQL   *University of Michigan*

➢ Recommendation Systems on Google Cloud   *Google Cloud*

➢ ETL and Data Pipelines with Shell, Airflow and Kafka   *IBM*

➢ Generative AI Language Modeling with Transformers   *IBM*

➢ Building Interactive User Interfaces Using React Library   *NIIT*

➢ Probabilistic Deep Learning with TensorFlow2   Imperial College London

SKILLS

➢ Programming Languages & Tools: C++, Python, MATLAB, Solidworks, Spark, Cadence virtuoso

➢ Data Science: SQL, PostgreSQL, ETL pipeline development, Azure DevOps, Google Cloud