YANGMING GUO

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EDUCATION

Beijing Institute of Technology Beijing, China
Master's Degree in Control Science and Engineering 09/2018 – 06/2021

- Average score: 82.69/100
- Core courses: Analysis of Modern Power Systems (96), Intelligent Control (86), Images Capture and Processing (84.5), Multi-source Information Filtering and Fusion (84)

Nanjing Agricultural University Nanjing, China
Bachelor's Degree in Automation 09/2014 – 06/2018

- Average score: 86.71/100
- Core courses: Microcomputer Principle and Applications (97), Analog Electronics Technology (94), Linear Algebra (97), Visual C++ Programming (98), Digital Electronics Technology (93), Advanced Mathematics II (95), Principles of Automatic Control Course Design (95), PLC Course Design (92)

PUBLICATIONS

1. Bao, X., Guo, S., **Guo, Y.**, Yang, C., Shi, L., Li, Y., & Jiang, Y. (2022). Multilevel operation strategy of a vascular interventional robot system for surgical safety in teleoperation. IEEE Transactions on Robotics, 38(4).
2. Xu, Z., **Guo, Y.**, Zhao, T., Zhao, Y., Liu, Z., Sun, X., Xie, G., & Li, Y. (2022). Abnormality classification from electrocardiograms with various lead combinations. Physiological Measurement, 43(7).
3. Zhu, Z., Lan, X., Zhao, T., **Guo, Y.**, Kojodjojo, P., Xu, Z., Liu, Z., Liu, S., Wang, H., Sun, X., & Feng, M. (2021). Identification of 27 abnormalities from multi-lead ECG signals: An ensembled SE_ResNet framework with Sign Loss function. Physiological Measurement, 42(6).

ACADEMIC CONFERENCE

1. **Guo, Y.**, Guo, S., & Yang, C. (2020, August). Feasibility study on cloud communication operation for an interventional surgery robot. In Proceedings of the 2020 IEEE International Conference on Mechatronics and Automation (ICMA) (pp. 443 – 447). Beijing, China. [Oral presentation and paper publication]
2. Guo, S., **Guo, Y.**, Bao, X., & Yang, C. (2019, August). A PID-type fuzzy logic controller for an interventional surgical robot. In Proceedings of the 2019 IEEE International Conference on Mechatronics and Automation (ICMA) (pp. 2529 – 2533). Tianjin, China. [Oral presentation and paper publication]

PATENTS

1. **Guo, Y.**, Hao, B., & Tang, R. (2023). Prediction method, device, apparatus, and medium for gene expression in cells after drug perturbation (CN116959569A). China National Intellectual Property Administration. Publication date: October 27, 2023.
2. **Guo, Y.**, & Xu, Z. (2022). ECG classification method based on deep learning, device, apparatus, and storage medium (CN114587378A). China National Intellectual Property Administration. Publication date: June 7, 2022.
3. Guo, S., Yang, C., **Guo, Y.**, & Bao, X. (2020). Master controller of an interventional surgical robot (CN212089720U). China National Intellectual Property Administration. Authorization date: December 8, 2020.
4. Guo, S., Yang, C., **Guo, Y.**, & Bao, X. (2020). Master operating device of an interventional surgical robot (CN212089719U). China National Intellectual Property Administration. Authorization date: December 8, 2020.

RESEARCH EXPERIENCE

Beijing Institute of Technology Beijing, China
Supervisor: Prof. Shuxiang Guo 09/2018 - 06/2021

Cloud-Based Teleoperated Vascular Interventional Robotic System

- Developed a cloud-based teleoperated vascular interventional robotic system to reduce surgeons' X-ray exposure and overcome the mobility and distance limits of wired systems
- Built a cloud communication framework on Tencent Cloud to transmit real-time master-console commands (push, pull, rotate) to the slave at the patient side
- Enabled both local and remote operation over public networks for telemedicine
- Implemented tracking metrics - Euclidean Distance, Manhattan Distance, and Dynamic Time Warping – to assess master-slave synchronization

- Demonstrated real-time teleoperation in a human vascular model; in long-distance experiments, maximum tracking errors were 25 mm (catheter) and 26.3 mm (guidewire), validating the system's feasibility

Beijing Institute of Technology Beijing, China
Supervisor: Prof. Shuxiang Guo 09/2019 - 06/2020
Feasibility Study on Cloud Communication Operation for an Interventional Surgery Robot

- Investigated cloud-based remote control for vascular interventional surgery to reduce surgeons' X-ray exposure and physical strain
- Built a master-slave robotic system: the master console (Geomagic Touch X with 6-DOF position and 3-DOF force feedback) transmitted real-time commands (push, pull, rotation) to the slave side via a cloud server
- Conducted experiments over public internet (cloud server in Shanghai; master and slave in Beijing) with a one-way communication latency of 25 ms
- Verified the system's feasibility and provided a data-driven foundation for cloud-based teleoperated robotic surgery
- Results presented at ICMA 2020 (EI indexed)

Nanjing Agricultural University Nanjing, China
Supervisor: Prof. Wei Lu 09/2016 - 12/2016
Design of an STM32-Based Orchard Targeted Spraying Robot

- Addressed low efficiency and high labor cost in conventional pesticide spraying by developing an autonomous precision spraying robot
- Designed an STM32F103-based control system, developed PCB layout, and performed circuit soldering and testing
- Developed target recognition and spraying control logic; implemented path planning and automatic calibration for a wheeled mobile platform
- Implemented multisensor fusion and intelligent navigation to enhance spraying accuracy and operational efficiency in orchards
- Awarded Second Prize in the 2nd "Dongfanghong Cup" National College Students Intelligent Agricultural Equipment Innovation Contest

Nanjing Agricultural University Nanjing, China
Supervisor: Prof. Wei Lu 03/2016 - 05/2017
Remote Management and Rescue System for Firefighters

- Addressed low visibility and safety challenges in fire scenes by developing wearable monitoring and rescue devices
- Designed and implemented a low-power, MSP430F149-based wearable monitoring system to track physiological signals (heart rate, pulse) and transmit data wirelessly
- Developed an ultrasonic-based handheld rescue locator to enable precise tracking of firefighters in hazardous environments; integrated embedded control and multimodal sensing
- Selected for the National Undergraduate Innovation Training Program
- Awarded Second Prize in the 10th iCAN National Innovation & Entrepreneurship Competition

WORK EXPERIENCE

Hangzhou iMedAI Hangzhou, China
Senior Algorithm Engineer 11/2023 - Present
LLM-based Academic Writing Intelligent Agent

- Designed an LLM-based academic writing agent to generate structured and up-to-date drafts by emulating domain experts
- Investigated state-of-the-art LLM-based solutions and guided internal technical roadmap discussions
- Re-implemented research code; built modular agents to generate outlines and prompts, and integrated a search engine for real-time data retrieval from academic databases
- Developed summarization and synthesis modules to compose end-to-end scientific article drafts.

RAG-based Knowledge Base System

- Built a Retrieval-Augmented Generation (RAG) system for a professional association's knowledge base using 1000+ historical conference video data

- Applied ASR to generate subtitles, applied prompt engineering to correct filler words and disfluencies, and performed segmentation based on semantics
- Designed multi-strategy retrieval combining keyword-based and semantic methods, and implemented reranking module to improve response precision

TCM Artificial Intelligence-Powered Platform

- Developed a web-based platform to predict traditional Chinese medicine (TCM) properties and molecular targets based on chemical structures and herbal metadata
- Designed front-end interface, built back-end service, and integrated enrichment analysis and network visualization modules
- Deployed and launched the platform, available at https://tcm-aipp.com

Pingan Technology Beijing, China

Algorithm Engineer (Full-time) 07/2021 - 06/2023

Intelligent Triage System Development

- Developed an intelligent triage system based on online consultation data from an internet hospital to recommend appropriate hospital departments for patient visits
- Cleaned and standardized ~20M online-consultation records; harmonized department labels across hospitals and defined 19- and 9-class taxonomies
- Developed text classification models that fuse chief complaint text with structured demographics (age, gender)
- Designed post-processing rules for specialty departments; achieved Acc@1: 0.83, Acc@3: 0.96, Acc@5: 0.98

Laboratory Test Recommendation System Development

- Developed multi-label classification model to recommend diagnostic laboratory tests based on electronic outpatient medical records
- Designed 900+ and 300+ label sets with physicians and engineered clinical features (symptoms, medications, tests, diagnoses) for multi-label text classification models
- Achieved F1-score of 0.689 (900+ labels) and 0.625 (300+ labels)

Drug-induced Gene Expression Prediction System Development

- Predicted drug-induced gene expression changes using the ChemCPA model
- Re-implemented and adapted ChemCPA on CMAP LINCS 2020 data; improved preprocessing pipeline and experimental validation. Enhanced generalization by initializing cell embeddings with untreated expression data and incorporating shared expression patterns into drug embeddings
- Achieved R-squared of 0.77 for differential expression genes in specific brain cells

Pingan Technology Beijing, China

Algorithm Engineer Intern 05/2020 - 11/2020

PhysioNet/Computing in Cardiology Challenge 2020 - 12-Lead ECG Clinical Diagnosis

- Participated in an international competition tasked with identifying clinical diagnoses from 12-lead electrocardiogram (ECG) recordings
- Developed an Se-ResNet model in PyTorch; improved generalization via K-fold cross-validation, CatBoost ensembling, and threshold tuning
- Achieved 3rd place in the official phase on hidden test sets

ADDITIONAL INFORMATION

Technical Skills

- Programming Languages: Python, C++, SQL
- Hardware Tools: Altium Designer
- Development Tools: Docker, Git, FastAPI
- Product & UI Tools: Figma

Language

- Chinese (Native speaker), English (Proficient)

Hobbies

- Long-distance running and staying active outdoors