Haoyang Hu

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Education

- **Nanjing University of Science and Technology (NJUST) [🌐]** *Sept. 2021 - Jun. 2025*
  *B.Eng in Cyberspace Security, under the guidance of **Prof. Zhichao Lian**.* Wuxi, China
  - GPA: 85.25/100, rank top 12%

Patents and Publications

C=Conference, J=Journal, P=Patent, A=Other Articles

[C.1] Yican Geng*, **Haoyang Hu***, Zhaoxuan Ge and Zhichao Lian. ***Network Intrusion Detection Algorithm Based on LightGBM Model and Improved Particle Swarm Optimization***. In 2024 IEEE Cyber Science and Technology Congress (CyberSciTech), DOI: 10.1109/CyberSciTech64112.2024.00021

[P.1] Chanying Huang, Changji Yao, **Haoyang Hu**, Kedong Yan. ***News recommendation method and system based on national secret algorithm and federated learning***. CN118094008A, Pending.

[P.2] **Haoyang Hu**. ***A Guide Cane and its Control Method***. CN111110531A, Active.

[P.3] **Haoyang Hu**. ***A Guide Cane***. CN212235240U, Active.

[A.1] **Haoyang Hu** and Zhen Peng. ***ESG Risks and Opportunities in the Development of Artificial Intelligence***. Knowledge Management, Tencent, Dec. 2024.

[A.2] **Haoyang Hu** and Zhen Peng. ***Observations on the Global Governance Landscape of Artificial Intelligence Governance***. Knowledge Management, Tencent, Nov. 2024. (Awarded as **'KM Good Article'**)

** : These authors contributed equally to this work.*

Projects

- **AISDR: An Study on AI-Based Technologies for Drug Registration Assistance** *Jun. 2024 - Current*
  - Pioneered the development of the industry's first quantifiable pharmaceutical registration process framework, collecting and compiling a comprehensive dataset.
  - Leveraged LLMs for feature selection and utilized Random Forest models for phase-based forecasting.
  - Applied LSTM algorithms for final result predictions on the constructed time series datasets.
  - Designed a recommendation trigger to provide clients with improvement suggestions when predictions fail.
  - Established a company based on this project, and am currently working on a high-quality research paper.
- **OptiCrow: Research and Development of an IoT Network Intrusion Detection System** *Feb. 2024 - Current*
  - Optimized LightGBM hyperparameters using Genetic Algorithms (GA) and Particle Swarm Optimization (PSO), significantly improving the efficiency and accuracy of IDS for predicting network intrusion traffic.
  - Applied the Crow Search Algorithm (CSA) with advanced strategies such as Levy flight, Cauchy mutation, and differential mutation to enhance global search capabilities and convergence speed.
  - Introduced binary conversion to discretize the continuous results of the Enhanced Honeybee Optimization (EHO) algorithm, improving both global search performance and computational efficiency.
  - Our preliminary work has been accepted by CyberSciTech 2024, where I represented and shared our findings!
  - Currently working on a follow-up, high-quality paper!
- **Efficient-FedRec-SM: News Recommendation System Based on Federated Learning and SM** *Sept. 2023 - Jan. 2024*
  - Participated in a graduate project to help protect gradient transmission in federated learning frameworks.
  - Used SM2 and SM9 national cryptographic algorithms to encrypt and digitally sign gradient data, ensuring security and integrity during transmission, and preventing data poisoning and other attacks.
  - Developed SM9-based functions for digital signing of gradient data on clients using Python, and applied SM2-based functions for encryption to secure user data privacy.
  - Decrypted received data on the server to verify the integrity and accuracy of the uploaded gradient data.
  - Awarded third prize in the National Cryptography Competition and pended a patent!
- **SafeGuide: Intelligent Guide Cane Based on Computer Vision** *Sept. 2018 - Dec. 2023*
  - Utilized Python and Arduino programming to implement over ten features, including intelligent recognition, obstacle avoidance, tracking, and alerting for pedestrians, vehicles, and other obstacles, using algorithms such as time difference, pulse echo, differential measurement, and FFT transformation.
  - Integrated the YOLO algorithm and micro probes to enable visual functionality, allowing the intelligent cane to accurately reflect its surroundings.
  - Designed and manufactured the intelligent cane using 3D printing technology combined with other materials, ensuring a balanced approach to both appearance and functionality.
  - Awarded one invention patent, one utility model patent, and received multiple awards in various competitions!

Work Experiences

- **Nanjing Nebulorix Co., Ltd.** *Nov. 2024 - Current*
  Co-Founder Nanjing, China
- **Tencent [🌐]** *Sept. 2024 - Dec. 2024*
  Digital Rights Protection Intern Shenzhen, China
  - Exploring AI governance, cybersecurity and privacy protection:
    - **Industry insights and research:** Conducted in-depth research on AI governance, cybersecurity and privacy protection, analyzing industry trends and peer strategies of relevant companies.
    - **Data analysis and reporting:** Contributed to the collection, analysis, and visualization of ESG data, assisted in drafting high-quality analytical reports, and supported data-driven decision-making.
  - Developing AI-driven efficiency tools:
    - **Daily News Reporting System:** Developed a workflow to automatically gather and select news on relevant topics, generate a report and deliver it to colleagues' mailboxes, which is already in operation.
    - **Writing Agent:** Built a proprietary knowledge base for training, designed specialized prompts, and developed a agent tailored for ESG report writing, which is set to be deployed in our team.
    - **Computer Vision Recognition:** Deployed an image recognition model for the 'Emin Environmental Protection Action Group' mini program using ResNet and OCR to identify bike, ebike, bus and other images. The mini program has been successfully launched and actively used by over 5,000 colleagues.
- **China Telecom [🌐]** *Jan. 2024 - Feb. 2024*
  Equipment Maintenance Support Intern Quzhou, China
- **CINGHOO Technology Co., Ltd. [🌐]** *Jul. 2023 - Aug. 2023*
  Data Forensic Analysis Intern Chengdu, China
- **MoreSec Technology Co., Ltd. [🌐]** *Jul. 2022 - Aug. 2022*
  Security Service Intern Hangzhou, China

Honours and Awards

Partial List

- **Competition Awards**
  - First Prize, National College Student Data Analysis Competition *Dec. 2023*
  - Third Prize, National Cryptography Technology Competition *Nov. 2023*
  - Third Prize, "TIPDM CUP" Data Mining Challenge *Jun. 2023*
- **School Honours**
  - First Prize, Outstanding Student Scholarship, NJUST (Top 4%) *Sept. 2024 & Apr. 2024*
  - Success Scholarship, NJUST *Sept. 2024*
  - Outstanding Class Cadre, NJUST (1/70) *Sept. 2024 & Apr. 2024*
  - Beyond Scholarship, NJUST *Mar. 2024*
  - Merit Student, NJUST (6/70) *Nov. 2023*
  - Third Prize, Outstanding Student Scholarship, NJUST (Top 15%) *Sept. 2023 & Mar. 2023 & Sept. 2022*

Students' Activities

- **Permanent Representatives** *Mar. 2024 - Current*
  Student Congress, NJUST
- **Secretary of the Reunion Branch** *Sept. 2021 - Current*
  Class of 2021 in Cyberspace Security, NJUST
- **Team Member** *Sept. 2021 - Current*
  Basketball & Badminton Team of the School of Cyberspace Security, NJUST
- **Team leader** *Jul. 2023 - Aug. 2023 & Jul. 2022 - Aug. 2022*
  Summer Social Practice Activity (Provincial Core Project)

Certifications

- Advanced Certified Data Analyst, China Financial Analysis Institute *Feb. 2024*
- Junior Industrial Internet platform development engineer, Talent Exchange Centre of MIIT *Jun. 2023*
- VRC Spin Up Head Referee Certification, REC Foundation *Apr. 2023*
- Judge Certification, REC Foundation *Apr. 2023*

Robotics

Awards and Honors (Partial List)

I have participated in 8 seasons of VEX-EDR (now known as VEX-V5 [🌐]) robotics competitions since elementary school.

- Second Runner-up, RoboCom World Robotics Competition Final, Beijing, China *Aug. 2018*
- Runner-up, National VEX Robotics Engineering Challenge, Xian, China *Aug. 2016*
- Glod Award, VEX World Championship, Louisville, USA [🌐] *Apr. 2016*
- Glod Award, Asia-Pacific Robotics Championship, Melbourne, Australia [🌐] *Dec. 2015*
- Champion, National VEX Robotics Engineering Challenge, Weihai, China *Aug. 2015*