阮宇迪

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教育及工作经历：

2022.09 – 2026.06 **重庆交通大学** **人工智能** **重庆**

相关课程：深度学习，机器学习，计算机视觉，概率论，高等数学等 **GPA:4.15/5 TOFEL:93 Rank: 1/66**

2023.07 – 2023.09 **上海全景医疗影像中心** **深度学习实习生** **上海**

相关工作：图卷积神经网络，多模态，3D 病灶分割等

2024.10 – 至今 **Hedra（美国）** **深度学习实习生** **加利福尼亚州**

相关工作：大模型加速、视频生成、数据清洗、Kubernetes 部署等

2024.08 – 至今 **浙江山主机器人** **CTO 助理** **浙江**

相关工作：计算机视觉、强化学习、机器人操作系统等

2024.06 – 至今 **浙江省农业智能装备与机器人重点实验室** **浙江**

2024.06 – 至今 **农业装备技术全国重点实验室** **浙江**

项目经历：

2024.10 – 至今 **Hedra Live Avatar 实时交互数字人** **主导开发**

相关技术: Diffusion Transformer、Multiprocessing、Torch dynamo 等

- 在 Hedra 实习期间，主导视频生成模型的实时化，从项目 MVP 设计到部署版本落地
- 利用 Dynamo 优化模型计算步骤，通过特征 Cache 技术在保证精度前提下加速模型
- Docker 包装项目，利用亚马逊 ECR、EKS、SQS Queue 监控并自动扩容

2025.05 – 至今 **医学 3D 多模态转换系统** **负责人、主导开发**

相关技术:VAE、Transformer、Lightning 等

- 训练 VAE 将 3D 医学影像数据压缩到 Latent space，解决计算资源的限制
- 利用多模态信息交集，特殊设计 Transformer backbone 训练过程，对缺失模态进行补全
- 利用 lightning 进行多 GPU 训练，特殊设计推理流程，解决 3D 数据显存占用问题

2023.05 – 2024.05 **城市列车视觉-激光-IMU-GNSS 多源融合导航系统** **负责人、主导开发**

相关技术: ROS、CUDA、C++、 TenosrRT 等

- 通过 TensorRT 部署在 NVIDIA Jetson 开发板上，使用 GPU 和 DLA 进行加速推理
- 利用 CUDA 对自定义算法进行并行化加速，实现算法的实时运算
- 利用 ROS 在多进程，多机器之间进行通信数据传输
- 多传感器融合里程计精度达到 1%

2024.05 – 2025.05 **幻视-3D 医疗影像解析系统** **负责人、主导开发**

相关技术: nnUnet、QT、Python、Kubernetes、VTK、Multiprocessing 等

- 利用 VTK 进行体素展示，设计 3D 交互窗口，多进程并发处理
- 利用 Docker 封装推理模型，利用 Kubernetes 根据请求数量动态扩容
- 处理 3D 医学数据，训练 3D 分割模型，取得 89.3 Dice Score

2024.02 – 2025.07 **OminiVision 集成图像增强系统** **主导开发**

相关技术: ECAFormer、QT、Python、ONNX 等

- 收集并预处理交通图像数据，设计模型并训练
- 将 SOTA 基础视觉任务模型转换为 ONNX 格式，集成到统一推理平台
- 设计 ECAFormer 模型，并发表在 Engineering Applications of Artificial Intelligence 期刊

科研成果：

发表论文：

[1] **Yudi Ruan**, Hao Ma, Weikai Li, Xiao Wang (2025). ECAFormer: Low-light Image Enhancement using Cross Attention. Engineering Applications of Artificial Intelligence.

[2] **Yudi Ruan**, Di Wang, Yijing Yuan, Shixin Jiang, Xianyi Yang (2025). SKPNet: Snake KAN Perceive Bridge Cracks through Semantic Segmentation. Intelligent&Robotics.

[3] **Yudi Ruan,** Ling Zhang, Liling Peng, Weikai Li, Xin Gao (2025).Identification of Major Depressive Disorder Using Multiple Functional Connection Pattern. Journal of Affective Disorders.

参研论文：

[1] Huaiqu Feng, Te Xi, **Yudi Ruan**, Dunhong Yang, Yulei Pan, Rongkai Shi, Bo Chen, Yongwei Wang1, Jun Wang (2024). Contrastive Clustering-driven Topological Organization Unveils Characterization of Hybrid-rice with In-Field for Variety Purification. Expert Systems With Applications.

[2] Huaiqu Feng, **Yudi Ruan**, Dongfang Li, Te Xi, Yulei Pan, Yongwei Wang, Jun Wang (2025). Low-altitude Remote Sensing-based Decentralized Motion Planning for Agricultural robotic swarm In-Field Environments. ISPRS Journal of Photogrammetry and Remote Sensing.

[3] Huaiqu Feng, **Yudi Ruan**, Dongfang Li, Te Xi, Yulei Pan, Dongdong Du, Yongwei Wang (2025). 1UGV-nUAV: In-Field Environments called the Energy-Constrained and Charging Station Low-altitude Remote Sensing-based Motion Planning. Nature Machine Intelligence

[4] Huaiqu Feng, **Yudi Ruan**, Te Xi, Yulei Pan, Dongdong Du, Yongwei Wang (2025). Accelerating Hybrid Rice Breeding with In-Field Based on Grid Mapping and Agri-UGV. Robotics and Autonomous Systems

[5] Rui Zhou, Chenhao Sun, Mingxiang Sun, **Yudi Ruan**, Weikai Li, Xin Gao (2024). Altered intra- and inter-network connectivity in autism spectrum disorder. Aging.

[6] Wenhao Zhou, Mingxiang Sun, Xiaowen Xu, **Yudi Ruan**, Chenhao Sun, Weikai Li, Xin Gao (2024). Multipattern graph convolutional network-based autism spectrum disorder identification. Cerebral Cortex.

[7] Sifu Zeng1, Jie Yang, Wang Luo and **Yudi Ruan** (2023). Few-shot segmentation with duplex network and attention augmented module. Frontiers in Neurorobotics.

[8] Weikai Li, Hongfeng Wei, Yanlai Wu, Jie Yang, **Yudi Ruan**, Yuan Li, and Ying Tang (2024). TIDE: Test-Time Few-Shot Object Detection. IEEE Transactions on Systems, Man and Cybernetics: Systems.

[9] Jie Yang, Xiaowen Xu, Mingxiang Sun, **Yudi Ruan**, Chenhao Sun, Weikai Li, Xin Gao (2023). Towards an accurate autism spectrum disorder diagnosis: multiple connectome views from fMRI data. Cerebral Cortex.

学科竞赛类获奖：

2024.01	美国大学生数学建模大赛	H 奖
2024.08	睿抗机器人开发者大赛（RAICOM）全国总决赛	全国一等奖
2024.10	全国高校商业精英挑战赛创新创业竞赛创业计划赛道全国总决赛	全国一等奖
2024.08	第二十六届中国机器人及人工智能大赛全国总决赛	全国二等奖
2024.07	"航大数据杯"第八届全国高校智能交通创新与创业大赛	全国三等奖
2023.11	全国大学生数学建模竞赛	重庆市一等奖
2023.08	第十八届全国大学生智能汽车竞赛（baidu）	西部赛区二等奖
2023.09	第十八届全国大学生智能汽车竞赛（iflytek）	西部赛区二等奖
2024.08	中国国际大学生创新大赛	重庆赛区银奖
2024.05	第十一届“大唐杯”全国大学生新一代信息通信技术大赛	重庆市二等奖
2023.05	第十六届中国大学生计算机设计大赛	重庆市二等奖
2023.07	第十二届“中国软件杯”	重庆市三等奖

荣誉及获奖：

2023 国家本科奖学金

2024 国家励志奖学金

2023 校三好学生

2023 校科创先锋

2023 校学习标兵

2024 校三好学生

Yudi Ruan

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Education and Work Experience：

2022. 09 – 2026. 06 Chongqing Jiaotong University Artificial Intelligence Chongqing

Relevant Courses: Deep Learning, Machine Learning, Computer Vision, Probability Theory, Advanced Mathematics, etc.

GPA:4.15/5 TOFEL:93 Rank: 1/66

2023. 07 – 2023. 09 Shanghai Panorama Medical Imaging Center Deep Learning Intern Shanghai

Relevant Work: Graph Convolutional Neural Networks, multimodal, 3D lesion segmentation, etc.

2024. 10 – current Hedra(US) Deep Learning Intern California

Relevant Work: Large Model Acceleration, Video Generation, Data Cleaning, Kubernetes Deployment, etc.

2024. 08 – current Zhejinag Starlord Robot Head of Research Zhejinag

Relevant Work: Computer Vision, Reinforcement Learning, Robot Operating Systems, etc.

2024. 06 – current Zhejiang Key Laboratory of Intelligent Sensing and Robotics for Agriculture Zhejinag

2024. 06 – current State Key Laboratory of Agricultural Equipment Zhejinag

Project Experience：

2024.10 – current **Hedra Live Avatar: Real-time Talking Avatar** **Primary Developer**

Related technologies: Diffusion Transformer, Multiprocessing, Torch Dynamo, etc.

- During my internship at Hedra, I led the real-time implementation of the video generation model, from the project MVP design to the deployment version.
- Utilized Dynamo to optimize the model computation steps and accelerated the model using feature caching technology while ensuring accuracy.
- Packaged the project with Docker, utilizing Amazon ECR, EKS, and SQS Queue for monitoring and automatic scaling.

2025.05 – current **Medical 3D multi-modality data conversion system** **Team Leader、Primary Developer**

Related technologies: VAE, Transformer, Lightning, etc.

- Trained VAE to compress 3D medical imaging data into the latent space, addressing the limitations of computational resources.
- Utilized the intersection of multimodal information and specially designed the Transformer backbone training process to complete missing modalities.
- Utilized Lightning for multi-GPU training and specially designed the inference process to address the issue of GPU memory usage with 3D data.

2023.05 – 2024.05 **Train Multi-Source Fusion Perception System** **Team Leader、Primary Developer**

Related technologies: ROS, CUDA, C++, TensorRT, etc.

- Deployed using TensorRT on the NVIDIA Jetson development board, utilizing GPU and DLA for accelerated inference.
- Utilized CUDA to parallelize and accelerate custom algorithms, enabling real-time computation of the algorithms.
- Utilized ROS for communication and data transmission between multiple processes and machines.
- The accuracy of the odometry in multi-sensor fusion reached 1%.

2024.05 – 2025.05 **Huanshi: 3D Medical Imaging Data Analysis Platform** **Team Leader、Primary Developer**

Related technologies: nnUnet, QT, Python, Kubernetes, VTK, Multiprocessing, etc.

- Utilized VTK for voxel visualization, designed a 3D interactive window, and implemented multiprocessing for concurrent processing.
- Packaged the inference model using Docker and utilized Kubernetes for dynamic scaling based on the number of requests.

Processed 3D medical data, trained a 3D segmentation model, and achieved an 89.3 Dice Score.

2024.02 – 2025.07 OminiVision: Image Enhancement and Analysis System Primary Developer

Related technologies: ECAFormer, QT, Python, ONNX, etc.

- Collected and preprocessed traffic image data, designed the model, and trained.
- Converted SOTA foundational vision task models to ONNX format and integrated them into a unified inference platform.
- Designed the ECAFormer model and published it in the Engineering Applications of Artificial Intelligence journal.

Research Achievements：

Published Papers：

[1] **Yudi Ruan**, Hao Ma, Weikai Li, Xiao Wang (2025). ECAFormer: Low-light Image Enhancement using Cross Attention. Engineering Applications of Artificial Intelligence.

[2] **Yudi Ruan**, Di Wang, Yijing Yuan, Shixin Jiang, Xianyi Yang (2025). SKPNet: Snake KAN Perceive Bridge Cracks through Semantic Segmentation. Intelligent&Robotics.

[3] **Yudi Ruan,** Ling Zhang, Liling Peng, Weikai Li, Xin Gao (2025).Identification of Major Depressive Disorder Using Multiple Functional Connection Pattern. Journal of Affective Disorders.

Co-authored Papers：

[1] Huaiqu Feng, Te Xi, **Yudi Ruan**, Dunhong Yang, Yulei Pan, Rongkai Shi, Bo Chen, Yongwei Wang1, Jun Wang (2024). Contrastive Clustering-driven Topological Organization Unveils Characterization of Hybrid-rice with In-Field for Variety Purification. Expert Systems With Applications.

[2] Huaiqu Feng, **Yudi Ruan**, Dongfang Li, Te Xi, Yulei Pan, Yongwei Wang, Jun Wang (2025). Low-altitude Remote Sensing-based Decentralized Motion Planning for Agricultural robotic swarm In-Field Environments. ISPRS Journal of Photogrammetry and Remote Sensing.

[3] Huaiqu Feng, **Yudi Ruan**, Dongfang Li, Te Xi, Yulei Pan, Dongdong Du, Yongwei Wang (2025). 1UGV-nUAV: In-Field Environments called the Energy-Constrained and Charging Station Low-altitude Remote Sensing-based Motion Planning. Nature Machine Intelligence

[4] Huaiqu Feng, **Yudi Ruan**, Te Xi, Yulei Pan, Dongdong Du, Yongwei Wang (2025). Accelerating Hybrid Rice Breeding with In-Field Based on Grid Mapping and Agri-UGV. Robotics and Autonomous Systems

[5] Rui Zhou, Chenhao Sun, Mingxiang Sun, **Yudi Ruan**, Weikai Li, Xin Gao (2024). Altered intra- and inter-network connectivity in autism spectrum disorder. Aging.

[6] Wenhao Zhou, Mingxiang Sun, Xiaowen Xu, **Yudi Ruan**, Chenhao Sun, Weikai Li, Xin Gao (2024). Multipattern graph convolutional network-based autism spectrum disorder identification. Cerebral Cortex.

[7] Sifu Zeng1, Jie Yang, Wang Luo and **Yudi Ruan** (2023). Few-shot segmentation with duplex network and attention augmented module. Frontiers in Neurorobotics.

[8] Weikai Li, Hongfeng Wei, Yanlai Wu, Jie Yang, **Yudi Ruan**, Yuan Li, and Ying Tang (2024). TIDE: Test-Time Few-Shot Object Detection. IEEE Transactions on Systems, Man and Cybernetics: Systems.

[9] Jie Yang, Xiaowen Xu, Mingxiang Sun, **Yudi Ruan**, Chenhao Sun, Weikai Li, Xin Gao (2023). Towards an accurate autism spectrum disorder diagnosis: multiple connectome views from fMRI data. Cerebral Cortex.

Awards in Academic Competitions：

2024.01	Mathematical Contest in Modeling / Interdisciplinary Contest in Modeling (MCM/ICM)	Honorable Mention
2024.08	RAICOM Robotics Developer Competition (RAICOM) CAIR Engineering National Finals	National First Prize
2024.10	National College Business Elite Challenge National Finals	National First Prize
2024.08	The 26th China Robotics and Artificial Intelligence Competition National Finals	National Second Prize
2024.07	National College Intelligent Transportation Innovation and Entrepreneurship Competition	National Third Prize
2023.11	National College Student Mathematical Modeling Competition	Provincial First Prize
2023.08	The 18th National College Student Intelligent Vehicle Competition, Baidu Track	Provincial Second Prize
2023.09	The 18th National College Student Intelligent Vehicle Competition, iFlytek Track	Provincial Second Prize
2024.08	China International University Student Innovation Competition	Provincial Second Prize
2024.05	National College Student New Generation Information and Communication Technology Competition	Provincial Second Prize
2023.05	The 16th China College Students Computer Design Competition	Provincial Second Prize

2023.07 China Software Cup University Student Software Design Competition (2023) Provincial Third Prize

Honors and Awards：

2023 National Undergraduate Scholarship

2023 Outstanding Student

2023 Model Student

2024 National Inspirational Scholarship

2023 Advanced Individual in Technology

2024 Outstanding Student