姓　　名	**康 辉**	研究领域涉及标签噪声学习、半监督学习、对比学习、语义分割、生成式模型等技术，并且具备丰富的工程技术与经验。
联系方式	**183 2170 6532**	
个人主页	**http://randydl.xyz/**	
电子邮件	**hui.kang.future@foxmail.com**	

教育经历

2022.10 - 2023.09	**悉尼大学**	**计算机科学**	**研究型硕士**
2012.09 - 2016.06	**中国民航大学**	**电子信息工程**	**学士**

科研经历

Preprint 2023	Channel-Wise Contrastive Learning for Learning with Noisy Labels
Preprint 2023	Unleashing the Potential of Regularization Strategies in Learning with Noisy Labels
ICCV 顶会	Phase-Amplitude Spectrum Disentangled Early Stopping for Learning with Noisy Labels
eBioMedicine 顶刊	Deep-Learning-Assisted Detection and Segmentation of Rib Fractures from CT Scans

工作经历

2021.07 - 2022.09 **数坤科技**

- 主导开发颅内出血临床检测系统，负责算法设计、自动化测试、Docker 部署、团队代码审核、系统代码重构。该系统荣获中国 NMPA 三类证，其可识别多种脑出血类型，敏感度达 96%，特异度达 94%，分割 Dice 系数达88%。深度参与前后端团队系统联调，负责算法侧 API 接口设计、模型调度优化等。

2019.08 - 2021.06 **点内科技**

- 主导开发肋骨骨折临床检测系统，其敏感度达92.9%，平均每张 CT 检测的假阳性数量为 5.27个，减少了大约 86% 的临床耗时。相关论文已在顶刊《柳叶刀》子刊上发表，联合顶会 MICCAI 制作开源了业内首个大规模肋骨骨折数据集。

2017.04 - 2019.07 **SAP 中国研究院**

- 作为核心算法成员开发 Argus 肺结节检测原型系统，获得 SAP 中国研究院创新项目第三名，并且后续升级为 SAP One Billion Lives 全球计划中的一个重要项目。
- 参与 SAP 核心前端框架的设计，主要负责研发大型项目管理系统基础库（包括复杂功能设计、性能优化、大版本重构），已成为 SAPUI5 重要基础控件。

2016.07 - 2017.03 **Honeywell 航空航天**

- 负责开发 Cockpit Flight Instrument 系统，主要用于图形化显示各种飞控参数，比如飞行速度，海拔高度和飞行姿态等，基于 C/C++ 等技术。

项目经历

详细信息望您查看我的个人主页

- Intelligent Detection of Pulmonary Nodules
- RSNA Intracranial Hemorrhage Classification
- Object Tracking Algorithm Based on MeanShift
- 3D-Object Modeling with Kinect in Indoor Condition

专业技能

- Python、C/C++、Shell、JavaScript、HTML、CSS
- Linux 部署、Docker 打包、Git 版本控制、自动化运维
- 对代码可靠性、重用性和可读性有较为深刻理解，擅长系统设计
- 熟悉多部门跨团队沟通，熟练团队合作技巧、敏捷开发、项目计划与推进

Hui Kang (康辉)

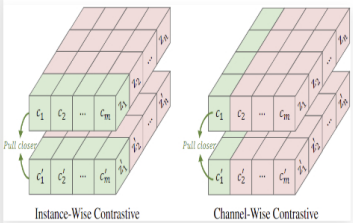
Computer Vision, Deep Learning, Web Techniques

About Me

I'm about to obtain my M.Phil. degree in the field of Computer Science at the University of Sydney (悉尼大学), where I've been studying since 2022. Before delving into research, I enriched my professional experience with a rewarding six-year work in Shanghai. Under the guidance of Prof. Tongliang Liu (刘同亮), I am conducting research on robust deep learning techniques capable of effectively handling imperfect data. This includes scenarios involving data corruption, limited supervision, and small datasets. Additionally, I am investigating the practical applications of these techniques in the field of computer vision.

In 2016, I graduated with a B.Eng. degree in Electronic Information Engineering from Civil Aviation University of China (中国民航大学), mentored by Prof. Hongying Zhang (张红颖). Throughout my career, I've had the privilege to work at several leading companies. By leading diverse projects utilizing C/C++, Python, and Web techniques, I've cultivated a profound understanding of code reliability, reusability, and readability, especially in constructing large-scale systems. These experiences have also equipped me with advanced teamwork strategies, adeptness in communication skills, and expertise in project management.

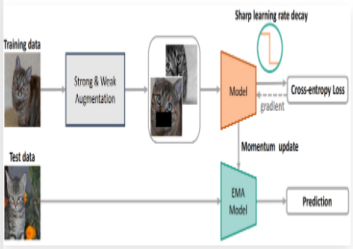
Publications



Channel-Wise Contrastive Learning for Learning with Noisy Labels [HTML, PDF]

Hui Kang, Sheng Liu*, Huaxi Huang*, Tongliang Liu. Preprint 2023

Recent studies show genuine labels can be found in mislabeled data features. To harness this, we introduce CWCL, which discerns true labels from noise by contrasting channels. Unlike traditional methods, CWCL yields refined, accurate features.

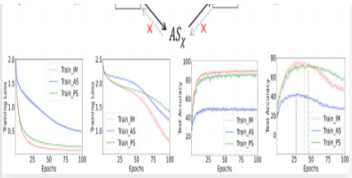


Unleashing the Potential of Regularization Strategies in Learning with Noisy Labels [HTML, PDF]

Hui Kang*, Sheng Liu*, Huaxi Huang*, Jun Yu, Bo Han, Dadong Wang, Tongliang Liu. Preprint 2023

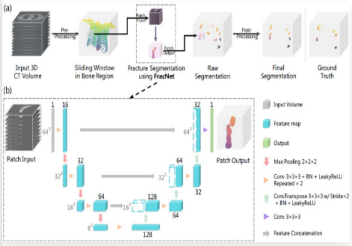
We demonstrate that a simple baseline using ce loss, combined with widely used regularization strategies, can be more effective than intricate algorithms.

PADDLES: Phase-Amplitude Spectrum Disentangled Early Stopping for Learning with Noisy Labels [HTML, PDF]



Huaxi Huang*, **Hui Kang***, Sheng Liu, Olivier Salvado, Thierry Rakotoarivelo, Dadong Wang, Tongliang Liu. **ICCV 2023**

In this paper, inspired by biological research results, we present that phase spectra can enhance the robustness of DNNs to label noise.



Deep-Learning-Assisted Detection and Segmentation of Rib Fractures from CT Scans: Development and Validation of FracNet [HTML, PDF, Video]

Liang Jin*, Jiancheng Yang*, et al, **Hui Kang**, Jiajun Chen, Ming Li. eBioMedicine (by **The Lancet**) 2020

We develop FracNet for detecting rib fractures in CT scans, which achieves high sensitivity with minimal false positives, significantly reducing clinical time.

Educations

2022/10 - 2023/09	M.Phil., School of Computer Science, The University of Sydney
2012/09 - 2016/06	B.Eng., Electronic Information Engineering, Civil Aviation University of China

Honors & Awards

Major GPA: 3.70/4.0
Linear Algebra: 97/100
Advanced Mathematics: 94/100
Digital Signal Processing: 93/100
C Programming Language: 92/100

First-class Scholarship - **Ranking: 5%**
Rockwell Collins Scholarship - **Ranking: 1/169**
Tianjin Government Scholarship - **Ranking: 1/169**
Second Prize of Beidou Cup China Contest - **National**
Third Prize of Challenge Cup Tianjin Contest - **Provincial**

Experiences

2021/07 - 2022/09
Shukun Technology

Algorithm Engineer

Involved in developing a clinical detection system for intracranial hemorrhage (ICH), which could automatically process images and assess them for hemorrhage within minutes. Trained with thousands of non-contrast CT (NCCT) scans from several hospitals, the system could identify all types of suspected hemorrhage, including intraparenchymal (IPH), intraventricular (IVH), subdural (SDH), epidural (EDH) and subarachnoid (SAH), with a sensitivity of 96%, specificity of 94% and segmentation dice coefficient of 88%.

2019/08 - 2021/06
Dianei Technology

Algorithm Engineer

Developed a clinically applicable automatic deep learning system for rib fractures detection from CT scans, which achieved a high sensitivity of 92.9% with an average of 5.27 false positives per scan and reduced approximate 86% clinical time consuming. A paper was published in eBioMedicine (by The Lancet). A subset of the dataset was open-source to research community, which was the first open large-scale dataset in this application, and we successfully hosted MICCAI 2020 RibFrac Challenge.

Software Engineer

2017/04 - 2019/07
SAP Labs China

Involved in the development of Argus, a prototype adept at detecting lung cancer signs in CT scans using advanced deep learning. Our innovation triumphed at the SAP Labs demo day, securing significant support from SAP's Shanghai development center. Argus now stands as a leading project in SAP's “One Billion Lives” initiative, aiming to tackle global challenges.

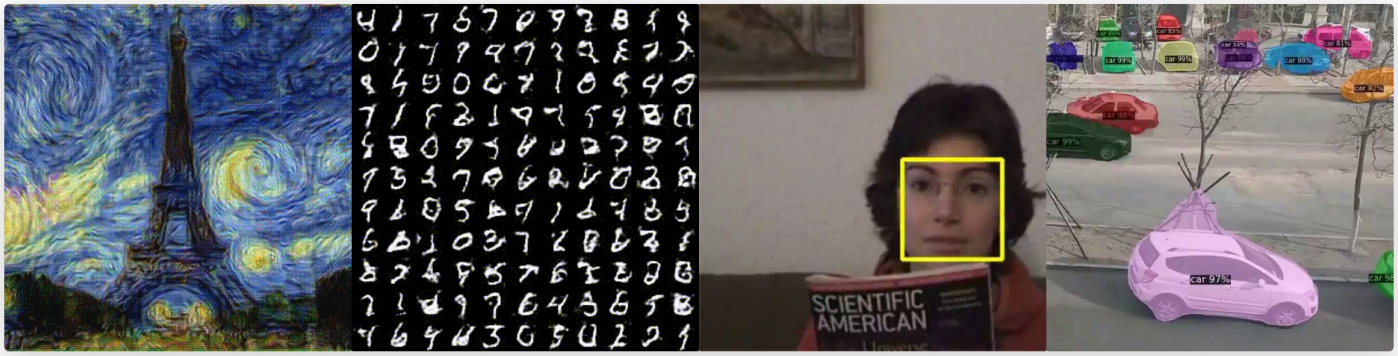
Actively involved in the creation of SAPUI5's Gantt Chart control using advanced web techniques. Collaborated with teams for seamless integration with other SAPUI5 components and optimized performance for large-scale applications.

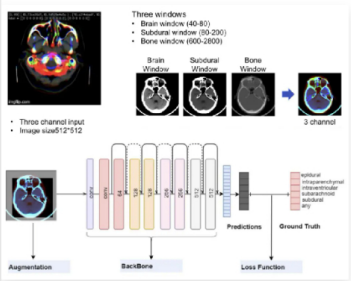
2016/07 - 2017/03
Honeywell Aerospace

Software Engineer

Involved in developing the cockpit flight instrument display system by C/C++ for Boeing company, which was used to display various flight parameters of aircraft graphically.

Projects





RSNA Intracranial Hemorrhage Classification

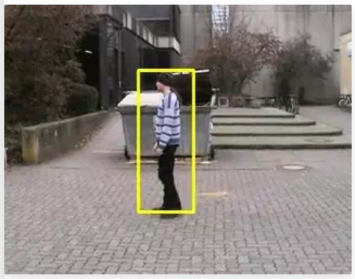
We combined three windows: the brain window (40, 80), subdural window (80, 200), and bone window (600, 2800) to enhance our input. Using transfer learning, we computed classification loss1 to capture intra-slice features from CT scans.

Simultaneously, we harnessed the GAP layer to understand inter-slice correlations in CT scans. By extracting and aggregating features from all slices, we calculated classification loss2, ensuring model also captures broader context.

Intelligent Detection of Pulmonary Nodules [Video]

Utilizing ASPP and attention mechanisms, an advanced 3D CNN segmentation model was devised. This model significantly improved the detection accuracy of diverse pulmonary nodules, considering their varied sizes, shapes, and types.

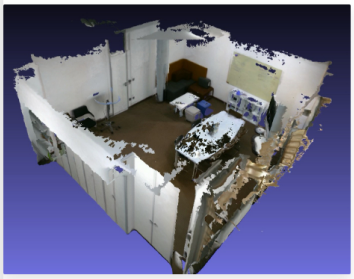
Addressing false positives in the segmentation model, hard negative mining and multi-model fusion were employed. This approach led to a remarkable decrease in misdiagnoses, cutting down false positives from 146.5 per scan to a mere 5.



Object Tracking Algorithm Based on MeanShift [PDF]

Drawing inspiration from the histogram of oriented gradients (HOG) algorithm, we've refined the traditional color histogram into a block-based version, the block-based color histogram offers a robust representation of local features.

Using histogram comparison, we introduced a "confidence map," a probability density indicating a target feature's presence in a new image. We then use the Meanshift algorithm to locate the target in this map.



3D-Object Modeling with Kinect in Indoor Condition

Introducing a rapid and straightforward 3D reconstruction technique leveraging Kinect. We begin by calibrating the Kinect's color camera to access its intrinsic parameters and subsequently align it with the depth camera.

Employing a unique inter-frame filtering method anchored in joint bilateral filtering, we refine the raw depth images. The ICP algorithm then ensures accurate point cloud alignment, culminating in a cohesive 3D point cloud representation.

Skills & Contact

Languages: Chinese (Mandarin), English
Development Tools: Linux, Docker, Git, Node.js, Numpy, PyTorch
Programming Languages: Python, C/C++, Shell, JavaScript, HTML5, CSS

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