

# Kai (Kai) Xie



Home: Suzhou, Jiangsu | 1994-11-10

3663 North Zhongshan Road, Shanghai, 200062 | (+86) 13862192033 | kxie\_shake@outlook.com | github.com/shakex

## EDUCATION

### East China Normal University

Shanghai

Master of Computer Science and Technology, M.S.

Sep. 2017 – Jun. 2020 (Expected)

- Research Interest: Computer Vision and Machine Learning, Image Semantic Segmentation.
- Courses: Pattern Recognition and Machine Learning, Advanced Engineering Math, Digital Image Processing, Image Analysis, Deep learning for Computer Vision Seminar, Frontier of AI, English for Academic Purposes.
- Teaching Assistant of Computer Vision (Spring 2018) and Operating System (Spring 2019).

### Jiangsu University of Science and Technology

Zhenjiang, Jiangsu

Bachelor of Computer Science and Technology, B.S.

Sep. 2013 – Jun. 2017

- GPA: 3.62/4.00 (Top 3% of class out of 122).
- Courses: Linear Algebra, Discrete Mathematics, C Programming Language, Data Structure, Digital Image Processing, Artificial Intelligence.
- Member of the Propaganda Department of Students' Union (2013) and Computer Association (2014-2016). IT Newcomer Scholarship awarded by alumni (Apr. 2016).

## PROFESSIONAL EXPERIENCE

### Sundear Information Technology Co., Ltd.

Shanghai

Algorithm Engineer Intern – Computer Vision

Jun. 2019 – Aug. 2019

- Responsible for designing and developing algorithms for fabric defect detection. Applied imaging processing techniques to detect and segment two main types of fabric defects: the surface and the linear defect. Participated in developing the Image Labeling and Management software based on OpenCV.
- Developed a demo for Automatically Recognizing Road Disease. It trains a CNN network to classify the road images with a high angle shot into two categories, i.e., images with and without road diseases. The algorithm achieves around 98% classification accuracy.

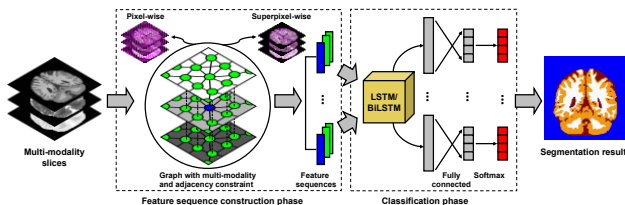
## SELECTED PROJECTS

### Shanghai Key Laboratory of Multidimensional Information Processing

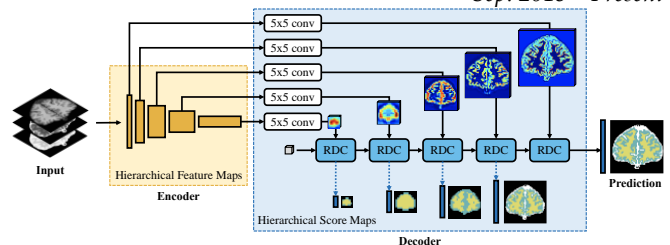
Shanghai

Medical Image Segmentation

Sep. 2018 – Present



- Work#1: A LSTM method with Multi-modality and Adjacency constraint is proposed for segmenting three tissues in Brain MRI. Two feature sequence generation ways in our method are used, i.e., features with pixel-wise and superpixel-wise adjacency constraint. The method is more robust than clustering-based methods like FCM, K-Means, and performs better than other feature classifiers like SVM and KNN, achieving 98.66% Dice Coefficient on the BrainWeb dataset.



- Work#2: It proposes a Recurrent Decoding Cell (RDC) for hierarchical feature fusion in the encoder-decoder segmentation networks. RDC leverages the ability of convolutional RNNs in memorizing long-term context information. The RDC-based segmentation network achieves 99.34% Dice Coefficient on the BrainWeb dataset, which is better than FCN, SegNet and U-Net, and is robust to image noise and intensity non-uniformity in medical MRI.

### Eye & Ent Hospital of Fudan University

Shanghai

Predicting Radiotherapy Sensitivity of Laryngeal Cancer based on Deep Neural Networks

Jul. 2019 – Oct. 2019

In this study, we enrolled 200 patients with laryngeal cancer (LC) who underwent standard radiotherapy alone. Patients were followed up and were classified into radiotherapy-sensitive (LC-RS) and radiotherapy-tolerant (LC-RT) groups according to their prognosis. I took the responsibility of modeling a convolutional neural network based on GoogLeNet, VGG16 and ResNet50 to predict the sensitivity of patients with radiotherapy, and combined the clinical features such as EBV, tumor markers, etc. to compare the imaging difference between LC-RS and LC-RT. Experimental results showed that our model reached 74.5% prediction accuracy among 55 patients of CT scans.

### Sundear Information Technology Co., Ltd.

Shanghai

Fabric Defect Detection

Jun. 2019 – Aug. 2019

An algorithm developed for fabric defect detection. The algorithm goes through the following step: Image preprocessing (crop, resize, remove uneven illumination, and remove moire patterns), Surface defect detection (OTSU threshold, morphological transformation), Linear defect detection (Canny edge detection, Hough line detection), Defect feature extraction and classification, Display and generate for XML output.

*My Spirit* is a 2D hand-drawn-style adventure game. It tells the story about the legendary life of Jerry from the spirit world to the real world. Players use keyboard or Xbox controller to control the characters. We use Unity as the game engine and C# as the programming language. The game is produced by our team [EBM](#), I took charge of the character/UI design, shooting and part of the algorithm realization in this project. [\[project page\]](#)

## PUBLICATIONS

---

- Ying Wen, **Kai Xie**, Lianghua He. Segmenting Medical MRI via Recurrent Decoding Cell. AAAI 2020. (CCF A) [\[paper\]](#)[\[code\]](#)
- **Kai Xie**, Ying Wen. LSTM-MA: A LSTM Method with Multi-modality and Adjacency Constraint for Brain Image Segmentation. IEEE International Conference on Image Processing (ICIP 2019). (CCF C) [\[paper\]](#)[\[bib\]](#)
- Xinxin Shan, **Kai Xie**, Qingli Li, Yue Lu, Ying Wen. Sparse Coding for Face Recognition with Multiple and Single Sample Per Person. (Submitted to ICASSP 2020, CCF B)
- Yutao Shen, **Kai Xie**, Qingli Li, Yue Lu, Ying Wen. Network Optimization via Channel-Reassessment Module. (Submitted to ICASSP 2020, CCF B)
- Ying Wen, **Kai Xie**. An Image Segmentation Method Based on Superpixel and Long Short-Term Memory. (**Patent**), no.201811560271.7.
- **Kai Xie**. Bolt Defect Detection Based on SURF (**Bachelor Thesis**), Jun. 2017.

## ADDITIONAL INFORMATION

---

<b>Achievements</b>	2nd Prize in LanQiao Cup Jiangsu Regional Contest (2017); 2nd Prize in Microsoft Imagine Cup National Finals (Games) ; 2nd Prize in Microsoft Imagine Cup National Finals (World Citizenship) <a href="#">[project page]</a> .
<b>Programming Languages</b>	Python (Skilled), C/C++ (Skilled).
<b>Software &amp; Tools</b>	MatLab, PyTorch, OpenCV, Latex, Markdown, Git, MS Office, Adobe Illustrator.
<b>Language Skills</b>	Mandarin (Native), English (Fluent, CET-6).
<b>Volunteers</b>	Photographer & Host (Summer 2018) in <a href="#">Study China Programme</a> , communicated with students from UK; Serve as a volunteer of <a href="#">Shanghai Roots &amp; Shoots</a> .
<b>Hobbies</b>	Photography (serve as a photographer of Media Department of ECNU Global Education Center, GEC), Video Editing, Badminton, Swimming, Indie Games.



Last updated: Dec. 2019

# 谢 恺



江苏苏州 | 1994-11-10

上海市，中山北路 3663 号，200062 | (+86) 13862192033 | kxie\_shake@outlook.com | github.com/shakex

## 教育背景

### 华东师范大学

上海

计算机科学与技术，学术型硕士

2017.09 – 2020.06 (预计)

- 研究方向: 计算机视觉与机器学习，图像语义分割
- 课程：模式识别与机器学习，高级工程数学，数字图像处理，图像分析，深度学习与计算机视觉讨论班，人工智能前沿，计算机专业英语
- 担任计算机视觉助教（2018 年春季）和操作系统助教（2019 年春季）

### 江苏科技大学

江苏镇江

计算机科学与技术，本科

2013.09 – 2017.06

- 绩点：3.62/4.00 (全系 122 人中前 3%)
- 课程：线性代数，离散数学，C 语言程序设计，数据结构，数字图像处理，人工智能
- 校学生会宣传部成员 (2013)，计算机协会会员 (2014-2016)；获得由校友颁发的 IT 新人奖学金 (2016.04)；推荐免试研究生 (2016.09)

## 职业经历

### 盛迭信息科技云研发部

上海

图像算法实习工程师

2019.06 – 2019.08

- 负责设计并开发布匹瑕疵检测算法。主要运用图像处理技术自动检测两大类布匹瑕疵：面型瑕疵和线型瑕疵；参与开发基于 OpenCV 的图像标注程序和布匹瑕疵管理程序。
- 开发了一个关于道路病害识别的软件 Demo。该方法通过训练一个卷积神经网络来对所采集的俯拍高速公路路面照片进行分类，筛选出其中包含路面病害的样本。目前该算法在小样本数据情况下取得了高于 98% 的分类准确率。

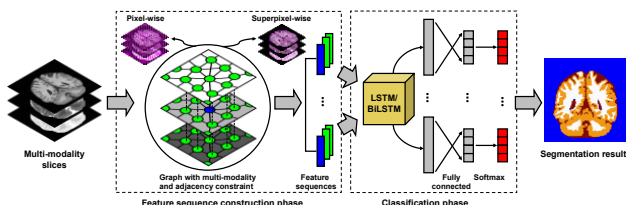
## 项目经历

### 上海市多维度信息处理重点实验室

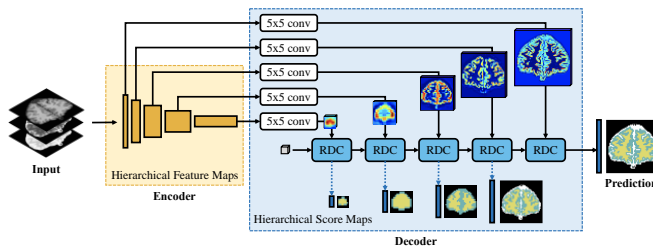
上海

医学图像分割

2018.09 – 至今



- 工作 1：采用了一种多模态和邻域约束的 LSTM 方法进行脑图像分割，并使用了两种特征序列生成方法：像素级邻域约束和超像素级邻域约束特征提取。该方法与现有的基于聚类的脑图像分割方法（FCM, K-Means）和利用特征提取+分类器（SVM, KNN）相比，在分割准确率上拥有更好的表现，在 BrainWeb 公共库上达到 98.66% 的 Dice 系数。



- 工作 2：提出了一个在编码-解码分割结构中使用的层级特征融合单元：循环编码单元。该单元充分利用了卷积神经网络（如 ConvLSTM, ConvGRU）在处理序列信息上的能力。基于循环编码单元的图像分割网络在 BrainWeb 公共库上达到了 99.34% 的 Dice 系数，其表现优于其他主流编码-解码模型（如 FCN, SegNet, U-Net 等）。并且，实验证明该方法对核磁共振图像中的噪声和偏移场有较好的鲁棒性。

### 复旦大学附属眼耳鼻喉科医院

上海

基于深度神经网络的喉癌放疗敏感性预测模型

2019.07 – 2019.10

在这项研究中，我们入组了 200 名接受单纯放疗标准方案的喉癌患者，随访它们的预后情况并根据预后分为放疗敏感和放疗耐受两组。我在其中负责建立基于 GoogLeNet, VGG16 和 ResNet50 的卷积神经网络模型预测患者的放疗敏感性，并结合临床特征如 EBV、肿瘤标志物等比较放疗敏感和放疗耐受患者 CT 影像上的差异。实验显示，利用该模型对 55 名患者 CT 扫描图像进行放疗敏感性预测可以达到 74.5% 的准确率。

### 盛迭信息科技云研发部

上海

布匹瑕疵检测

2019.06 – 2019.08

该项目实现了一种实用的布匹瑕疵自动检测方法。算法层面主要有以下步骤：图像预处理（图像裁剪、调整大小、去光照不均匀、去摩尔纹），面型瑕疵检测（OTSU 自适应阈值、形态学变换），线型瑕疵检测（Canny 边缘检测、Hough 直线检测），疵点特征提取并分类（区分常见类型瑕疵如停车挡、断纬、断经、并纬、结头、油污、浆斑等）、显示并输出 xml 文件。

My Spirit 是一个 2D 手绘风格的冒险解谜类游戏。它讲述了主人公 Jerry 从精神世界到现实世界的传奇人生经历。玩家使用键盘或 Xbox 手柄来控制角色。游戏采用 Unity 作为开发引擎，使用 C# 作为开发语言。这个游戏由我们的团队 EBM 共同制作完成，我在这个项目中负责人物和 UI 的设计、分镜以及部分算法的实现。[\[项目页面\]](#)

## 论文和专利

- Ying Wen, **Kai Xie**, Lianghua He. Segmenting Medical MRI via Recurrent Decoding Cell. AAAI 2020. (CCF A) [\[paper\]](#)[\[code\]](#)
- Kai Xie**, Ying Wen. LSTM-MA: A LSTM Method with Multi-modality and Adjacency Constraint for Brain Image Segmentation. IEEE International Conference on Image Processing (ICIP 2019). (CCF C) [\[paper\]](#)[\[bib\]](#)
- Xinxin Shan, **Kai Xie**, Qingli Li, Yue Lu, Ying Wen. Sparse Coding for Face Recognition with Multiple and Single Sample Per Person. (已投稿 ICASSP 2020, CCF B)
- Yutao Shen, **Kai Xie**, Qingli Li, Yue Lu, Ying Wen. Network Optimization via Channel-Reassessment Module. (已投稿 ICASSP 2020, CCF B)
- 文颖, 谢恺. 一种基于超像素和长短时记忆网络的图像分割方法 (发明专利), no. 201811560271.7
- 谢恺. 基于 SURF 特征的螺栓缺陷检测 (本科毕业论文), 2017 年 6 月

## 补充信息

主要获奖	蓝桥杯程序设计大赛江苏赛区二等奖 (2017) ; 微软创新杯全国总决赛二等奖 (游戏组, 2016) ; 微软创新杯全国总决赛二等奖 (世界公民组, 2015) <a href="#">[项目页面]</a>
编程语言	Python (熟练), C/C++ (熟练)
软件和工具	MatLab, PyTorch, OpenCV, Latex, Markdown, Git, MS Office, Adobe Illustrator
语言技能	普通话 (母语), 英语 (熟练, CET-6)
志愿活动	在 <a href="#">体验动感中国项目</a> 中担任摄影师兼闭幕式主持人 (2018 夏季), 与来自英国的大学生进行交流; <a href="#">上海根与芽</a> 志愿者
兴趣	摄像 (华东师范大学国际教育中心媒体组摄影师), 视频剪辑, 羽毛球, 游泳, 独立游戏



最近更新：2019.12