



Xiaogang Xu

Undergraduate student major in information and electronic engineer. Passionate about image processing, computer vision and machine learning, with strong technical, business, and interpersonal skills for working in a team and successfully completing a project.

Personal Data

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Education

Sep. 2014 - present	College of Information Science And Electronic Engineering, Zhejiang University, Major: Electronic Engineering & information Science
June. 2015 - present	Chu Kochen Honors College, Zhejiang University Minor: Advanced Honor Class of Engineering Education (40 students selected from 5600, receiving honors coursework training in Modern Engineering and cross-disciplinary sciences)

Interest

My research interests include machine learning, computer vision, image processing and data analysis. I am interested in the applying of those technologies into reality, such as medical field. I'm skilled in programming and mathematical ability. Nowadays, I am especially interested in the field of deep learning and computer vision.

These days I have been reading the book of “deep learning” written by Bengio and the book of “Convex Optimization” written by Boyd and so on. I found it useful and important for us to apply machine learning into the field of computer vision.

Honors and Awards

- **National Scholarship** (2015) : Provided by Ministry of Education of the People’s Republic of China for top 1% students.
- **ISEE-NEW Student Award** (2015): Awarded to 20 students selected from the whole College (about 200 students) for outstanding performance.
- **Rank 3rd in College of Information Science And Electronic Engineering** (2015), with GPA **89.69/100(3.95/4)**.
- **Rank 8th in College of Information Science And Electronic Engineering** (2016), with GPA **89.75/100(3.96/4)**.
- **Title of Outstanding Students** (2015, 2016): Selected from top 3% students for brilliant comprehensive development.
- **Excellent Students** (2015, 2016): Selected from top 10% students for excellent comprehensive development.
- **First-Class Scholarship For Outstanding Merits** (2015): Selected from top 10% students for outstanding performance.
- **Mathematical Contest in Modeling (Honorable Mention)** (2016) : COMAP (U.S.A)
- **Mathematical Contest in Modeling (First Prize)** (2016) : Rank 9th of 189 teams in Zhejiang University.
- **Undergraduate Electronics Design Contest (Third Prize)** (2016) : Rank 14th of 30 teams in Zhejiang University.
- **Undergraduate Physical Innovation Contest (Second Prize)** (2015) : Selected from top 30% students in Zhejiang province with outstanding performance in physics.
- **Undergraduate Advanced Mathematics Contest (Second Prize)** (2015) : Selected from top 30% students in Zhejiang province with outstanding performance in advanced mathematics.
- **Zhejiang Provincial Government Scholarship** (2016): Provided by Zhejiang Provincial Government for outstanding students.
- **China Undergraduate Mathematical Contest in Modeling** (2016) : National second prize.

- **The second prize scholarship for excellence in research and innovation** (2016) : Award for the students who have great achievement in research or academic competition.
- **The Second Prize of the National Talents Training Base** (2016)

Research Experience

Mar. 2016 – Sep.2016 ZJU Robot Laboratory, Hangzhou

Team Leader of Research: **Robot location recognition and path planning in real time**

Research Assistant,Advisor: Assistant Prof. Chunlin ZHOU

- Using the high definition global camera and the processing method of computer vision based on RGB to get the coordinates of all DaNI robot in the map and track them in the real time.
- Implement A* Planner and Artificial Potential Field method on a DaNI robot to acquire ideal path and navigation in real time. Combine with the Parallel computing method to increase the speed and the accuracy of computing.
- Using two robots to simulate the scene of the police track the thief in the city.
- The code and documents can be found in the website of my github:
<https://github.com/xiaogang00/Wheeled-Mobile-Robots>

Nov. 2016 – Jan.2017 ZJU Robot Laboratory, Hangzhou

Team Leader of Research: **Target identification and gait planning for Bipedal robot**

Research Assistant,Advisor: Assistant Prof. Chunlin ZHOU

- Measure the camera parameters for Nao Robot. Improve the camera model to improve the identification accuracy.
- Implement Hough transform to detect the table tennis in the scene.
- Computing the principle of inverse kinematics of the leg to complete the gait planning. Robots can move to the table tennis accurately.
- The code and documents can be found in the website of my github:
<https://github.com/xiaogang00/Bipedal-Mobile-Robot>

Mar. 2016 – Nov.2016 Population and development research institute

School Of Public Affairs ZheJiang University Hangzhou Team

Leader of Research: **The model of transfer probability on healthy-unhealthy population** Research

Assistant,Advisor:Prof. Hong Mi

- Collecting the data of healthy and unhealthy population in all provinces of China through the sixth census. Especially the population of older.
- Analyze the data we collected using Matlab after we disposal data. The process of disposing data is mainly aimed at deal with the data missed in the report of census.
- Design the model of mathematics including the method of k-means and markov model to compute the transfer probability between the healthy and unhealthy older people.
- **Have gotten a software patent : An software for computing transition probability of ageing population health state using the iterative algorithm.**

June. 2016 – Oct.2016 ZJU Machine vision and navigation laboratory, Hangzhou

Team Leader of Research: **The semantic analysis of indoor scene based on the RGB-D**

Research Assistant, Advisor: Assistant Prof. Xiaojin Gong

- Employ the method of image segmentation to locate every items we interested in the indoor scene.
- Implement the classification algorithm using machine learning(such as SVM and neural network) to label all items.
- Implement the depth descriptor to represent the feature for each patch in images and describe the support relation of items in the door.
- Completing the method of **outline detector and Markov random field.**
- **Using the framework of Deep learning, such as FCN, R-FCN, to achieve a greater result for this project.**
- **I have written a Chinese paper for this work and is plan to contribute to the Journal of Zhejiang University (Engineering Science). The paper can be found in the web:**

<https://github.com/xiaogang00/Semantic-understanding-of-indoor-scene>

Oct. 2015 - May. 2016 Microelectronics Institute of Zhejiang University

Leader of Research: **The development of health monitoring app on android**

Research Advisor: associate professor Yubo Li

- Implement the user's interface of app through which users can learn about some health indicators for themselves.
- According to health indicators, design the function of the app which will indicate the appropriate advice for users.
- **Code and Chinese document can be found in my github: <https://github.com/xiaogang00/The-development-of-health-monitoring-app>**

Oct. 2016 - Now Microelectronics Institute of Zhejiang University

Team leader of Research : **3D image quality assessment based on binocular**

Research Advisor: associate professor Yong Ding

- We taking two ways to complete this project. The first way is using the binocular model to fuse the left image and right image into cyclops image, then apply the technology of 2D image quality assessment on it, such as SSIM.
- The second way we put forward is to implement the feature extraction by binocular model. Then train those feature on the database in which the image has subjective score. The technology is SVR, which is an effective machine learning for regression problem.
- We check the result of our frame on the public 3D image database. They include Live phase, IVC, MCL and MMSPG. The result on database illustrate the effectiveness of our algorithm.
- Act as the first author to complete a paper “**No-reference Stereoscopic Image Quality Assessment with Saliency-guided Binocular Feature Consolidation**” which is plan to be submitted to **IEEE Sign Processing Letters**. Using the method of natural scene statistics(NSS) and local spatial and spectral entropy for feature extraction. Combined with the feature of disparity map and SVR to pooling the score. And completing the step of feature consolidation.
- Act as the third author to complete a paper “**Stereoscopic Image Quality Assessment by Analyzing Depth and Local Texture Information**”.

Interests and Activities

July. 2015

Volunteer activities of Science Summer Camp in national universities , ZheJiang University, Hangzhou
Acting as a **guidance to lead teenagers from different provinces** to visit the laboratories in ZJU.

Apr. 2016

Chu Kochen Honors College, Zhejiang University
Served as **student interviewer** for the enrollment of excellent students into Chu Kochen Honor College

May. 2015

Volunteer for Asian Physics Olympiads, Zhejiang University, Hangzhou
Served as **student volunteer** for the students from all over the Asian with high physical level

May. 2015

Volunteer for ZJU alumni group wedding, Zhejiang University, Hangzhou
Served as **liaison man** for the alumni from all over the world. The main task is to communicate with them and introduce the activity.

Languages and Frameworks

Matlab	Formal training in college (develop mathematical model & implement complex algorithms and machine learning program).
C / C++	Formal training in college (complex data structures and implement computer vision subject using OPENCV).
Java	Formal training in college (Implement the task of Android development)
SPSS	Formal training in college (Analyze the data which should be managed with statistical methods)
Python	Self-Study in college (text processing & web scraping & leetcode).
Assembly Language	Formal training in college(dosbox & File decoding & Base-development)
Tensorflow	Using this deep learning frameworks to complete the project of face recognition And I also use other deep learning framework: Caffe and Keras.



徐晓刚

个人信息

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教育经历

2014.9 - 至今	浙江大学信息与电子工程学院 主修专业：信息工程
2015.6 - 至今	浙江大学竺可桢学院 工程教育高级班

研究兴趣

本人的主要研究兴趣领域在于计算机视觉，机器学习和数据挖掘领域。特别是将机器学习方法(如深度学习)方法运用到计算机视觉领域。

荣誉和奖励

- 国家奖学金 (2015)
- ISEE 新人奖学金 (2015)
- 信息与电子工程学院，信息工程专业排名第三(2015)，GPA 89.69/100(3.95/4).
- 信息与电子工程学院，信息工程专业排名第八(2016)，GPA 89.75/100(3.96/4).
- 优秀学生称号 (2015, 2016)
- 三好学生荣誉称号(2015, 2016)

- 学业一等奖奖学金 (2015)
- 美国数学建模竞赛二等奖 (2016)
- 浙江大学数学建模竞赛一等奖 (2016)
- 全国大学生数学建模竞赛国家二等奖 (2016)
- 浙江大学电子设计竞赛三等奖 (2016)
- 浙江省物理创新竞赛二等奖 (2015)
- 浙江省高等数学竞赛二等奖 (2015)
- 浙江省政府奖学金 (2016)
- 浙江大学研究与创新二等奖学金 (2016)
- 国家人才培养基地二等奖 (2016)

科研经历

Mar. 2016 – Sep. 2016 浙江省，杭州市，浙江大学机器人实验室
研究课题：机器人实时定位与路径规划
指导老师：周春琳副教授

- 使用全局高清摄像头以及基于计算机视觉的 RGB 图像处理方法，寻找出 DaNI 机器人在地图中的实时位置；
- 完善 DaNI 小车的 A*路径规划算法和人工势场方法用来获取理想的实时路径规划和导航。结合同并行计算的方法提高计算的速度和精度；
- 使用两辆 DaNI 小车机器人同时进行定位与路径规划；

Nov. 2016 – Jan. 2017 浙江省，杭州市，浙江大学机器人实验室
研究课题：双足机器人目标识别与步态规划
指导老师：周春琳副教授

- 通过对 Nao 双足机器人的摄像头进行标定，测定参数，完善相机模型。继而使用霍夫变换检测场景中需要的小球。
- 结合腿部逆运动学原理，规划 Nao 机器人的步态，使得机器人能够正确定位到小球所在位置，并且用脚踢球。

Mar. 2016 – Nov. 2016 浙江省，杭州市，浙江大学公共管理学院，人口与发展研究所
研究课题：全国各省老年人口健康概率转移模型
指导老师：米红教授

- 利用全国第六次人口普查数据，统计各省老年人口的健康人数与不健康人数；
- 对搜集到的数据进行预处理，之后利用 Matlab 软件进行分析。建立数学模型，在基于马尔科夫概率转移模型的基础上，使用机器学习算法，如 k-均值算法，层次聚类等 分析各省市老年人口健康概率的趋势以及它们之间的联系；
- 目前已经根据该算法设计一套软件，并且获得计算机软件著作权，软件名为：人口老龄化多健康状态转移概率的自迭代算法软件。

June. 2016 – Oct. 2016 浙江省，杭州市，信息与电子工程学院，机器视觉实验室

研究课题：基于 RGB-D 与深度学习的室内场景语义分割

指导老师：龚小谨副教授

- 我们的目标是使用类似图像分割的方法将室内场景中我们感兴趣的物品进行分割并且标注；
- 在 RGB-D 框架下，使用机器学习方法，例如支持向量机和神经网络对分割出来的超像素进行分类；
- 在 RGB-D 框架在使用 kernel 描述子来提取图像特征并且进行超像素的划分，并且通过这些描述子来描述物体之间的空间关系；
- 在 RGB-D 框架下使用马尔科夫随机场等图像语义分割手段来提升效果；
- 在深度学习框架下，使用如 FCN, R-FCN 等网络来达到更好的效果；
- 在此期间熟练掌握使用多种深度学习框架，如 **Tensorflow, Keras, Theano, Caffe**;
- 在此次研究中写有一篇中文论文并且准备发表到浙江大学学报（工学版），具体项目代码和论文可以在以下网站上找到：<https://github.com/xiaogang00/Semantic-understanding-of-indoor-scene>

Oct. 2015 - May. 2016 浙江省，杭州市，浙江大学微电子学院

研究课题：基于安卓端的健康监测 app 开发

指导老师：李宇波副教授

- 完善 app 的用户交互界面，使得用户可以随时了解他们的健康指标信息；
- 根据健康指南，依据 app 测得的人体健康状态，给使用者一些建议；
- 本项目的代码和中文文档说明可以在以下网站找到：<https://github.com/xiaogang00/The-development-of-health-monitoring-app>

Oct. 2016 - Now 浙江省，杭州市，浙江大学微电子学院

研究课题：3D 图像的质量评价算法研究

指导老师：丁勇副教授

- 我们提出两种方法来完成这个项目。第一种方法是使用双目视觉模型来融合左右视图，并且在融合得到的 2D 视图上使用经典的 2D 图像质量评价算法来进行衡量，如 SSIM；
- 第二种方法是从图像的左右视图中分别提取图像特征，并且使用机器学习中进行回归的 SVR 模型输出最后的图像质量分数；
- 我们在公开的数据库上检测我们算法的效果，他们主要包括 Live phase, IVC, MCL 以及 MMSPG. 实验的结果都表明我们的算法设计是有效的；
- 已经作为第一作者完成一篇英文文献，**“No-reference Stereoscopic Image Quality Assessment with Saliency-guided Binocular Feature Consolidation”** 准备投稿到 SCI 期刊：IEEE Sign Processing Letters. 在其中主要是利用图像的自然统计特征来提取特征，包括空间域和频域的熵特征以及视差图的统计特征等。结合 SVR 算法来完成最后的分数映射步骤。
- 作为第三作者完成一篇英文文献 **“Stereoscopic Image Quality Assessment by Analyzing Depth and Local Texture Information”** . 准备投稿到 SCI 期刊：IEEE Sign Processing Letters.