焦捷

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教育经历

卡耐基梅隆大学——匹兹堡校区 **（大三）2022 届**
计算机科学, GPA: 4.0/4.0

相关课程

机器学习导论*，算法设计与分析*，编程语言基础*，并行及顺序数据结构与算法， 计算机系统，理论计算机科学入门，函数式编程，命令式编程，人工智能问题表达和问题解决，概率论

技能

编程语言: Python, SML, Java, C/C++, JavaScript , Swift (iOS 开发)
框架: Numpy, Scipy, Tensorflow, Keras, Mongodb **工具:** Git, Unix, Linux, CUDA;

工作经历

中科院大气物理研究所 **2019 年 6 月 --- 2019 年 8 月**
实习研究员，*“基于单个雾天图片的能见度预测”*

- 用 Tensorflow 和 Keras 设计深度卷积神经网络来对雾天 2D 图像进行能见度测量
- 用 Numpy 进行数据读写，结构化；通过 DCP 及傅立叶变换等方法对图像进行预处理
- 用 Keras 和 Pytorch 实现了 GPU 并行数据读写和并行训练来加速
- 最终模型在高能见度图片上误差达到 2～3 公里， 低能见度图片上误差达到 500 米～1 公里， 较传统测量方法有两倍提升

CMU 语言技术研究所 **2018 年 10 月至 2019 年 5 月**
研究助理， *Zoom City*

- 用 JavaScript/TypeScript 编写儿童书软件中的人机互动和动画效果
- 一学期内完成了一本几何电子书的开发，用 JavaScript 开发算法识别用户画布上的几何图形，识别准确率达到可投入生产的水准

项目经历

Zhi-hu Spider **2019 年 12 月至 2020 年 1 月**

- Python3 实现网络爬虫， 每天爬取知乎网站上固定一组关键词的搜索结果， 并更新本地储存的数据
- 设计程序通过 request 包发送 HTTP 请求并用 BeautifulSoup 解析返回的 json 文件
- 完成了将请求返回的数据在用户指定的 Mongodb 数据库和 Excel 表格中的储存
- 通过 Crontab 设置定时命令使爬虫自动化； 用 Docker 容器实现程序微服务化以便捷用户使用

Social Sudoku **2017 年 7 月至 2017 年 8 月**

- 用 Swift 和 Xcode 开发 iOS 数独应用， 在提供游戏的同时通过储存用户信息来实现社交功能
- 设计了生成数独和解决数独的算法；通过 Wilddog 云通信 API 实现了用户登录信息和帐号信息的云储存
- 在 40 个队伍中成为进入决赛展示的 5 个队伍之一

AI Pacman **2019 年 1 月至 2019 年 5 月**

- 用 python 实现 AI 算法（A* Search, Q-learning, Markov Decision Process, Hidden Markov Model, Particle filtering），在 Pacman 游戏中找到最优获胜路径
- 使用强化学习（Reinforcement Learning）和逻辑规划（Logic Planning）算法的程序达到最佳人类玩家的表现

其他信息

Github: https://github.com/rabbit721

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Education

Carnegie Mellon University, Pittsburgh, PA **May 2022**
Bachelor of Science in Computer Science (SCS) GPA: 4.0/4.0 Dean's List Fall 2018 - Fall 2019

Related Coursework

Introduction to Machine Learning (Phd)*, Algorithm Design and Analysis*,
Parallel and Sequential Data Structures and Algorithms, Introduction to Computer Systems

Skills

Programming Languages: Python, SML, Java, C, C#, Swift (iOS development)

Packages and Frameworks: Numpy, Scipy, Tensorflow, Keras, Mongodb **Tools:** Git, Linux, CUDA

Work and Research Experience

Meteorological Science and Technology Center, IAP, CAS[1], Beijing, CHN **Jun 2019 – Sept 2019**
Research Intern, *Visibility Estimation based on Single Image*

- Designed a convolutional neural network ensemble with Tensorflow to estimate visibility distance from images
- Used Numpy to parse data from meteorological sensors and preprocessed images with techniques like DCP maps and Fourier Transform
- Accomplished parallel computing with GPU using Keras to accelerate training
- Achieved 1~2 km MSE error on long-distance images, and 500m~1000m MSE on short distance images; significant improvement compared to traditional method

Language Technology Institute, CMU, Pittsburgh, PA, U.S **Oct 2018 – May 2019**
Research Assistant**,** *Zoom City*

- Designed user interface and implemented interactions and animations in JavaScript/TypeScript and HTML5 in an Ionic Cordova app using Angular
- Developed programs in JavaScript that identify geometric shapes from users' drawings on canvas as part of a children's book project
- Completed development of one book in one semester, and the accuracy of geometric shape recognition achieved production standard

Project Experience

Zhihu-Spider, Beijing, CHINA **Dec 2019 – Jan 2020**

- Accomplished a web scraper in Python3 to store search result of a set of keywords on Zhihu.com
- Designed programs that makes HTTP calls using the request library with appropriate error handling
- Achieved storage of response data in Mongodb database specified by the user and in formatted Excel documents
- Automated web scraping by adding Crontab control that updates the stored data daily; Containerized the scraper with Docker to simplify delivery

AI Pacman, CMU, Pittsburgh, PA, U.S. **Jan 2019 – May 2019**

- Implement algorithms, including Q-Learning, TD-Learning, Markov Decision Process, Hidden Markov Model, Particle filtering, in Python to teach pacman (the game agent) to find optimal paths
- Program using reinforcement learning achieved performance comparable to best human players

Social Sudoku, Shanghai, CHINA **July 2017 – Aug 2017**

- Developed an iOS Sudoku app with Swift that allowed users to socialize while solving Sudoku
- Developed algorithms that generated and checked the validity of Sudoku
- Accomplished online storage of users' login credentials and information through Wilddog Sync API; Selected as a finalist, 5 out of 40 teams