Chang Liu

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Education

- **University of Massachusetts, Lowell** — Lowell, MA
  *Ph.D. Candidate in **Computer Science; GPA: 3.89/4.00*** — *Sep. 2014 – May. 2019 (expected)*
- **Huazhong University of Science and Technology** — Wuhan, China
  *Bachelor of Engineering in **Computer Science and Technology;*** — *Sep. 2007 – July. 2011*

Skills

- **Programming Experiences**: Java, C/C++, Python, OpenCV, MySQL, Android, Matlab, LaTeX
- **Research Tools**: Caffe, Tensorflow, Scikit-learn
- **Research Interest**: deep learning, computer vision, machine learning, medical imaging, edge computing
- **Misc Skills**: Git, GNU make/cmake, Shell

Professional Experience

- **University of Massachusetts** — Lowell, MA
  Research and Teaching Assistant — *Sep. 2014 - Present*
  - **Video Monitoring and Analysis**: Build high-performance detecting and tracking system for people detection. Conduct human activity recognition and prediction based on video analysis using neural network and image processing filters.
  - **Tuberculosis(TB) X-ray Image Classification**: Improve medical image processing algorithms with deep learning models using neural network. Study low-level image representation with TB manifestation. Propose fast and accurate algorithm for accurate TB diagnosis. Extend deep learning models and image processing pipeline for CT-image analysis and cancer diagnosis.
  - **Object Detection and Classification**: Design customized deep learning models for accurate food image classification and detection. Finetune Convolutional Neural Network(CNN) models with fine-tailed image dataset to improve accuracy in other domain space. Evaluate model performance in various datasets and metrics.
  - **Edge Computing and Mobile Sensing**: Implement deep learning models running on mobile devices with Tensorflow. Design deployment schemes to keep balance of performance and computing efficiency. Implement C/S architecture and offline deep learning-based mobile application.
  - **Teaching Assistant**: Tutor Computing III/IV and Software Engineering. Teach software programming using C++. Help project design and management.
- **Intellifai.ai** — Hangzhou, China
  Software Engineer Intern — *May. 2017 - Sep. 2017*
  - **System Architecture**: Design system architecture for automatic nodule detection and lung cancer diagnosis. Develop software using QT/C++ based on MITK to integrate deep learning models with CT-image analysis and classification. Lead a team to customize and deploy system in real-world hospital.
  - **Medical Imaging**: Implement Faster-RCNN, U-NET for segmentation and detection in lung CT-images. Design CNN models for accurate classification and detection. Improve decision-making reasoning for cancer diagnosis.
  - **Software**: Collect user needs and design annotation software to collect human-labelled data. Integrate annotation system with deep learning framework to train CNN models. Customize released software for various PCAS/DICOM equipments.
- **TP-LINK Technologies Co., Ltd** — Shenzhen, China
  Software Engineer — *Jun. 2011 - Jun. 2014*
  - **Portable 3G/LTE MiFi**: Compatible design and customize to support various 3G/LTE USB modems. Develop wireless communication backend and SMS function using Qualcomm's RIL service and chipset.
  - **Embedded Wireless Router**: Implement AT command to support SMS with SIM-based modems. Develop software for 3G/LTE network and traffic control. Write webpage for router management and setting.
  - **Android Software Development**: Develop software and application for customized ROM in smartphone, including FM Radio, Gallery and Camera. Customize Android framework and middleware to support Qualcomm-based chipsets with audio and video sensors. Involve in code review and system integration for automatic building and testing.

- **Huazhong University of Science and Technology** Wuhan, China
  Undergraduate Research Assistant *Aug.2010 - Apr.2011*
  - **Algorithm Design and System Implementation**: Develop software for human pose estimation, video surveillance and age estimation using OpenCV. Implement the state-of-art vision algorithms in C++ and Matlab in realtime system for search groups and companies.

Publications

- **Chang Liu**, Yu Cao, Marlon Alcantara, Benyuan Liu,et al. "TX-CNN: Detecting Tuberculosis in Chest X-Ray Images using Convolutional Neural Network." *International Conference on Image Processing* (**ICIP**), Sep. 2017.
- Marlon Alcantara, Yu Cao, **Chang Liu**, Benyuan Liu, et al. "Improving Tuberculosis Diagnostics using Deep Learning and Mobile Health Technologies among Resource-poor Communities in Perú." *Smart Health, Elsevier* (**SMHL**), Apr. 2017.
- **Chang Liu**, Yu Cao, Yan Luo, Guanling Chen, et al. "A New Deep Learning-based Food Recognition System for Dietary Assessment on An Edge Computing Service Infrastructure." *IEEE Transactions on Services Computing* (**TSC**), Jan. 2017.
- Yu Cao, **Chang Liu**, Benyuan Liu, Maria Brunette, et al. "Improving Tuberculosis (TB) Diagnostics using Mobile Health Technologies among Resource-poor and Marginalized Communities." *IEEE Conference on Connected Health: Applications, Systems and Engineering Technologies* (**CHASE**), Jun. 2016.
- **Chang Liu**, Yu Cao, Yan Luo, Guanling Chen, et al. "DeepFood: Deep Learning-based Food Image Recognition for Computer-aided Dietary Assessment." *International Conference On Smart Homes and Health Telematics* (**ICOST**), May 2016.

Related Courses

- Operating System
- Machine Learning
- Data Mining
- Natural language processing

Research Projects

- **DeepFood**: A deep learning based food recognition system for dietary assessment.
- **CAD4Lung**: A computer-aided lung cancer diagnosis system using neural networks.
- **TX-CNN**: A convolutional neural network(CNN) for detecting tuberculosis in chest X-ray images.

Honors/Activities

- **NSF Student Travel Scholarship**: IEEE CHASE, 2016
- **Employee Excellence Awards**: TP-LINK, 2012 - 2013
- **National Endeavor Scholarship**: China, 2009