Chang Liu

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Profile

- Recent PhD graduate in computer science with hands-on programming experience using Java/C++/Python/OpenCV for internship and research projects
- Consistently recommended by professors and supervisors for research capability in various machine learning and computer vision tasks using tensorflow and Caffe.
- Flexible communication skills and project management using Scrum and Agile workflow with open-source software
- Fluent speaker for delivering Competent Communication Presentations at Toastmasters Club; teaching and tutoring graduate students in Computer Science and Software Engineering courses.

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**;* — *July 2011*

Technical Skills

- **Platforms**: Unix, Ubuntu, CentOS, Windows 10, MacOS
- **Languages**: Java, C/C++, Python, Shell, CMake/Make, LaTeX
- **Development Tools**: QT, OpenCV, MySQL, Android Studio, Eclipse, PyCharm, MATLAB
- **Research Tools**: Caffe, Tensorflow, Scikit-learn
- **Project Management & Version Control**: Git, SVN, Agile ZenHub
- **Research Experience**: deep learning, computer vision, machine learning, medical imaging, edge computing

Professional Experience

- **University of Massachusetts** — Lowell, MA
  Research and Teaching Assistant — *Sep. 2014 - Present*
  - **Mobile Computing**: Implementing object detection and image classification models running on mobile devices with TF-Lite. Training Mask RCNN/SDD/Faster RCNN models using tensorflow object detection API using Python. Implementing C/S architecture and offline deep learning-based mobile application in Android Phone.
  - **Video Monitoring and Analysis**: Built high-performance pedestrian detecting and tracking system using YOLO and tracker in OpenCV using C++ and QT Creator. Trained pedestrian detector using indoor camera images with various deep learning framework including YOLO and tensorflow object detection API under CentOS.
  - **Tuberculosis(TB) Classification**: Studied low-level image representation for different TB manifestation using OpenCV. Improved preprocessing and data augmentation algorithms for X-ray images for TB classification using C++ and Caffe.
  - **Object Detection and Classification**: Trained customized deep learning models for food image classification and detection using Caffe and tensorflow. Served tensorflow models in Google Cloud using TF-Serving. Impelemented RESTful API for serving Caffe model in the cloud using Python.
  - **Teaching Assistant**: Tutor Computing III/IV and Software Engineering. Teach software programming using C++. Assist project management using Agile and Scrum with Github Zenhub.
- **Intellifai.ai** — Hangzhou, China
  Software Engineer Intern — *May 2017 - Aug. 2017*
  - **System Architecture**: Designed system architecture for automatic nodule detection and lung cancer diagnosis. Implemented lung segmentation algorithm and nodule detection with Faster RCNN/UNET for lung CT-images. Developed software using QT/C++ based on MITK to integrate deep learning models with CT-image analysis and classification. Leaded a team with 4 members to customize and deploy system in real-world hospital.
  - **Software**: Implemented a MITK plugin using QT and C++ for nodule visualization using VTK and ITK. Collected user needs and designed annotation software to collect human-labelled CT-Image data. Integrated annotation system with deep learning framework to train CNN models consistently using XML and JSON. Released customized software to be compatible with various PCAS/DICOM equipment.

- **TP-LINK Technologies Co., Ltd** Shenzhen, China
  Software Engineer *Jun. 2011 - Jun. 2014*
  - **Embedded Wireless and 3G/LTE Router**: Designed software service to support various 3G/LTE USB modems for wireless network using C++ in embedded Linux system. Implemented AT command to support SMS for 3G/LTE models using C++ and Qualcomm's RIL API. Developed software for 3G/LTE network and traffic control.
  - **Android Software Development**: Developed software for customized ROM in smartphone, including FM Radio, Gallery and Camera using Java. Customized Android framework and middleware with Android's build system. Involved in code review and system integration for automatic building and testing using Gerrit and Jenkins.
- **Huazhong University of Science and Technology** Wuhan, China
  Undergraduate Research Assistant *Aug.2010 - Apr.2011*
  - **Algorithm Design and System Implementation**: Implemented the state-of-art vision detectors in C++ and MATLAB in Windows using MFC and Visual C++. Developed demo software for automatic age estimation using human face image in C++.

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

- **Outstanding Reviewer**: Elsevier Neurocomputing, 2018
- **NSF Student Travel Scholarship**: IEEE CHASE, 2016
- **Employee Excellence Awards**: TP-LINK, 2012 - 2013
- **National Endeavor Scholarship**: China, 2009