Hanxiang, HAO

PERSONAL INFORMATION

Gender: Male **Age:** 24 **Mobile Phone:** +01 607-882-3948 **Email:** haohanx323@outlook.com

Address: 1000 Northside DR. Apt 1263, Atlanta, GA

EDUCATION BACKGROUND

Cornell University   **2015. 08-2016. 12**

- Master of Engineering in Electrical and Computer Engineering

- GPA: 3.9/4.3

Beijing Institute of Technology   **2011. 08-2015. 07**

- Bachelor of Engineering in Electrical Engineering and Automation

- GPA: 3.8/4.0

WORK EXPERIENCES

***Computer Vision Engineer,* Software Automation Inc., Atlanta**   **2017. 07-Presnet**

Description: Involved projects related to the development of image-processing algorithms to support fabric handling, identification, as well as defect detection systems.

- Implemented deep learning network (Siamese Fully Convolutional Network) for semantic segmentation;

- Applied pruning to deep learning network for computation reducing;

- Implemented convolution operation using sparse kernel with CUDA support for previous pruning usage;

- Generated synthetic data by blender rendering engine for fabric-segmentation simulation.

- Improved the accuracy for semantic segmentation to 98.6% and increased the running speed of the model to 9.8 times than previous version after pruning.

***Research Assistant,* Deep Learning Internship in Rice University**   **2017. 02-2017. 06**

Description: Designed and implemented the algorithm for object tracking using deep reinforcement learning.

- Implemented Siamese network to compare the similarity between image patches with their search areas;

- Used Asynchronous Advantage Actor-Critic model to select the best patch from the similarity maps in the previous step;

- Improved the tracking accuracy by applying bounding box regression (R-CNN) on the selected patch.

ACADEMIC EXPERIENCES

Project *Lung Lobes Segmentation in CT Scans*, Cornell University   **2016. 08-2016. 12**

Description: Accomplished the design of a pulmonary vessel and fissure segmentation system.

- Extracted lung vessel using 3D intensity-based region growing and morphological operation;

- Segmented the fissures among 5 lobes based on Hessian matrix and 3D vector-based region growing.

Project *Cancer Cell Tracking,* Cornell University   **2016. 04-2016. 08**

Description: Designed an algorithm for tracking cancer cells in image sequences.

- Applied feature-based strategy matching each cell to the previous frame;

- Used Recurrent Neural Network detecting the cells in mitosis procedure to refine the result of detection.

Project *Automatic Panorama Stitching,* Cornell University   **2016.02-2016. 04**

Description: Implemented feature detection, feature description, feature matching and image alignment to generate panorama from a series images.

- Executed Harris corner detector as feature detector;
- Applied MOPS (Multiscale Oriented PatcheS) as a feature descriptor to identify the feature points;
- Matched the feature points between two images with ratio test of SSD (Sum of Squared Differences);
- Implemented homography alignment with RANSAC (RANdom SAmple Consensus).

Project *Gradient based Eye Tracking Algorithm*, Cornell University   2015. 10-2015. 12

Description: Implemented a tracking algorithm for pupil localization in image sequence.

- Designed an algorithm based on gradient and cascade classifier to find the center of each pupil;
  - Applied the cascade classifier to search a coarse region of face;
  - Searched for the center of pupil by finding the local maximum of the dot product between the gradient of each pixel and unit displacement between the assumed center point and the pixel;
- Achieved the accuracy of 95% in BioID database.

Project *Eye Fundus Image Segmentation*, Cornell University   2015. 09-2016. 12

Description*:* Designed a segmentation system to extract vasculature in eye fundus image.

- Designed and developed two algorithms based on matched filter response:
  - Matched filter with first-order derivative of Gaussian and genetic algorithm optimization;
  - Matched filter with piecewise threshold probing applying different threshold value on different region of interest in retinal image.

Competition of Robotics, Cornell University   2015. 11-2015. 12

Description: Designed a control system with computer vision technics to control a two-arm robot for a football game.

- Controlled the robot arm to pick up blocks as defenders on the playground with automatic detection with in-hand camera;
- Detected and picked up the golf ball with the camera of Kinect as an over-head camera;
- Designed a motion planner using rapidly exploring random tree (RRT).

Project *Auto-balancing System Design of 2-axis Camera Mount*, BIT   2015. 03-2015. 06

Description: Designed an auto-balancing system of a pan-tilt camera mount on aircraft;

- Developed a color-based segmentation algorithm to detect and localize the specific target using OpenCV;
- Designed a PID controller to control the 180-degree and 360-degree motors.

LANGUAGE AND PROFESSIONAL SKILLS

- Skilled in C, Java, C++, Python, Matlab, TensorFlow, PyTorch, CUDA, OpenCV, ITK and Blender;
- Keen interest in music, member of Percussion in Cornell University Wind-Symphony, with certificate of Snare Drum in Chinese Conservatory of Music (Ninth Level)

HONORS & AWARDS

- Second Prize in Innovation Competition of Century Cup (Freescale Intelligent Car) (2/55)   **2014. 06**
- Second-class Scholarship (three times), BIT   **2012-2014**
- Third-class Scholarship (twice), BIT   **2012-2013**
- Merit Student, BIT   **2012. 09**