# Changjiang Cai

Ph.D. Candidate – Department of Computer Science
Stevens Institute of Technology

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## Objective

To seek research internship for Ph.D. students, in the field of computer vision, machine learning and deep learning.

## Education

- **Stevens Institute of Technology** — **Hoboken, NJ, USA**
  *Doctor of Philosophy in Computer Science , anticipated 2020* — *Jan 2015 - Present*
  Research Interests: Computer Vision and Machine Learning. Specifically, stereo matching and semantic segmentation. Advisor: Philippos Mordohai

- **Stevens Institute of Technology** — **Hoboken, NJ, USA**
  *Master of Engineering in Electrical Engineering* — *Aug 2013 - Feb 2016*
  Concentration: Computer Vision and Machine Learning. Advisor: Gang Hua

- **Xi'an Jiaotong University** — **Xi'an, Shaanxi, China**
  *Mechanical Engineering, no degree earned* — *Aug 2009 - Jul 2013*
  Research Area: Digital Image Processing. Advisor: Dehong Yu

- **Northwestern Polytechnical University** — **Xi'an, Shaanxi, China**
  *B.E. in Automobile Engineering* — *Aug 2005 - Jul 2009*
  Thesis: Structural Design and 3D Modeling of an Assistive Robot. Advisor: Renping Shao

## Skills

- **Programming Languages:** Python& C++ Hybrid, C/C++, Python, Matlab
- **Library & APIs:** Tensorflow, Keras, PyTorch, Caffe, CUDA, OpenCV, Eigen, Boost C++
- **Database:** MySQL, PostgreSQL
- **Tools:** Vim, Git, CMake, Bash, Tmux
- **OS Platforms:** Linux, macOS, Windows

## Languages

- Chinese (native), English (proficient)

## Research Projects

- **Project (Ongoing):** *Exploiting Segmentation-aware CNN to Disparity Estimation*
  - To leverage segmentation cues via mapping the raw image intensities into embeddings which are used to generated local attention masks for disparity estimation.
- **Project (Ongoing):** *Generalization and Robustness in Deep Learning Based Stereo Depth Estimation*
  - Our project aims at improving the generalization and robustness performance of deep learning based depth estimation.
- **The CBMV_ROB Entry in the Robust Vision Challenge:** *Workshop in CVPR 2018*
  - Finished the CBMV_ROB entry in the stereo challenge, based on the combination of the CBMV volume computed as in our previous work and the local expansion algorithm for optimization.
- **CBMV:** *A Coalesced Bidirectional Matching Volume for Disparity Estimation*
  - Generated a matching volume by coalescing diverse evidence from a bidirectional matching process via random forest classifiers
  - Evaluated our algorithm on Middlebury, KITTI, and ETH3D datasets.
- **RankCrowdsourcing:** *Budget-conscious Ranking by Non-interactive Crowdsourcing*
  - Designed a crowdsourced ranking algorithm enabling task requester to obtain a good full ranking result from the crowdsourced pairwise comparison, with a limited budget.
- **Epitome Transform Coding:** *Towards Joint Compression of Images*
  - Proposed epitome transform coding, an approach to joint compression of a set of images.
- **Undergraduate Thesis:** *Structural Design and 3D Modeling of an Assistive Robot*
  - Designed a rotary-joint manipulator with six degrees of freedom via SolidWorks.

## Teaching Experience

- **CS442 - Database Management Systems** — **Stevens Institute of Technology**
  *Teaching Assistant* — *Aug 2016– Dec 2016*

## Publications

- Konstantinos Batsos, **Changjiang Cai**, Philippos Mordohai. *CBMV: A coalesced bidirectional matching volume for disparity estimation.* IEEE Conference on Computer Vision and Pattern Recognition (CVPR'2018), Salt Lake City, Utah, June 2018.
- **Changjiang Cai**, Haipei Sun, Boxiang Dong, Bo Zhang, Ting Wang, Hui Wang.*Pairwise Ranking Aggregation by Non-interactive Crowdsourcing with Budget Constraints.* The 37th IEEE International Conference on Distributed Computing (ICDCS) 2017, June, 2017, Atlanta, GA.
- Haoxiang Li, Mohammed Kutbi, Xin Li, **Changjiang Cai**, Philippos Mordohai, Gang Hua, *An Egocentric Computer Vision based Co-Robot Wheelchair.* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016.