

KUN HE

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EDUCATION

- Ph.D. in Computer Science**, Boston University, Boston, MA 2013 - 2018
Thesis: *Learning Deep Embeddings by Learning to Rank*
- M.Sc. in Computer Science**, Boston University, Boston, MA 2013
Thesis: *Stochastic Functional Descent for Learning Support Vector Machines*
- B.Sc. in Computer Science and Technology**, Zhejiang University, China 2010

TECHNICAL STRENGTHS

- Programming Languages** C/C++, Matlab, Python
- Deep Learning Software** Caffe, MatConvNet, Tensorflow, Keras, PyTorch
- Numerical Optimization** Extensive experience with discrete and continuous optimization

RESEARCH EXPERIENCE

Boston University, Boston, MA 2010 - Present
Research Assistant, Computer Vision & Machine Learning *Advisor: Prof. Stan Sclaroff*

- **Ph.D. thesis:** Using deep neural networks and “learning to rank” formulations to learn low-dimensional feature embeddings for visual data. This enables fast and accurate nearest-neighbor retrieval/matching in applications including: image search, low-level computer vision, and cross-modal retrieval between everyday video and natural language.
- **Object detection and pose estimation:** Developed a kernel-based structured prediction framework to jointly solve object detection and continuous pose estimation, using structural SVMs.
- **Weakly-supervised learning:** Worked on learning object detectors with weak supervision, and associated non-convex optimization problems.
- **Image segmentation:** Collaborated on quantifying and predicting the inherent ambiguity in the image foreground segmentation task, and investigated its use in crowdsourcing applications.

Brown University, Providence, RI 01/2014 - 08/2014
Visiting Student *Host: Prof. Pedro Felzenszwalb*

- Collaborated on object detection with latent variable models, and non-convex optimization in the Majorization-Minimization framework. Developed a new optimization framework, named Generalized Majorization-Minimization, that improves upon the original.

Zhejiang University, Hangzhou, China 03/2009 - 06/2010
Undergraduate Research Assistant *Advisors: Dr. Guofeng Zhang and Prof. Hujun Bao*

- Low-level computer vision research training, topics include stereo matching, optical flow estimation, and augmented reality. Completed Bachelor’s thesis on real-time augmented reality.

WORK EXPERIENCE

Honda Research Institute USA, Mountain View, CA

Research Intern

Summer 2017

Host: Dr. Yan Lu

- Worked on learning deep neural networks to extract local image features, for improving long-term self-localization in autonomous driving.

Disney Research, Pittsburgh, PA

Research Intern

Fall 2013, Summer 2015

Host: Dr. Leonid Sigal

- Summer 2015: Worked on weakly-supervised object recognition guided by natural language.
- Fall 2013: Developed a structured prediction method for object detection and continuous pose estimation. Also worked on improving visual speech synthesis with “dynamic visemes” and machine learning.

PUBLICATIONS

Journal Publications:

- [1] Hashing with Mutual Information
Kun He*, Fatih Cakir*, Sarah Adel Bargal, and Stan Sclaroff (*equal contribution)
Under review, IEEE Transactions on Pattern Recognition and Machine Intelligence (PAMI)
Tech report arXiv:1803.00974, 2018
- [2] Predicting Foreground Object Ambiguity and Efficiently Crowdsourcing the Segmentation(s)
Danna Gurari, **Kun He**, Bo Xiong, Jianming Zhang, Mehrnoosh Sameki, Suyog Dutt Jain, Stan Sclaroff, Margrit Betke, and Kristen Grauman
International Journal of Computer Vision (IJCV), 2018

Conference Publications:

- [3] Local Descriptors Optimized for Average Precision
Kun He, Yan Lu, and Stan Sclaroff
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018 (to appear)
- [4] Hashing as Tie-Aware Learning to Rank
Kun He, Fatih Cakir, Sarah Adel Bargal, and Stan Sclaroff
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018 (to appear)
Tech report arXiv:1705.08562, 2017
- [5] MIHash: Online Hashing with Mutual Information
Kun He*, Fatih Cakir*, Sarah Adel Bargal, and Stan Sclaroff (*equal contribution)
IEEE International Conference on Computer Vision (ICCV), October 2017
- [6] Parameterizing Object Detectors in the Continuous Pose Space
Kun He, Leonid Sigal, and Stan Sclaroff
European Conference on Computer Vision (ECCV), September 2014
- [7] Scale Resilient, Rotation Invariant Articulated Object Matching
Hao Jiang, Tai-Peng Tian, **Kun He**, and Stan Sclaroff
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), June 2012

Others:

- [8] Generalized Majorization-Minimization
Sobhan Naderi Parizi, **Kun He**, Stan Sclaroff, and Pedro Felzenszwalb
Tech report arXiv:1506.07613, 2015

[9] Stochastic Functional Descent for Learning Support Vector Machines

Kun He

M.Sc. Thesis, Boston University, August 2013

HONORS AND AWARDS

Honorary graduate of the Chu Kochen Honors College, Zhejiang University

Outstanding Bachelor's Thesis, School of Computer Science and Technology, Zhejiang University, 2010

PROFESSIONAL ACTIVITIES AND SERVICES

Student member, IEEE

Reviewer/External Reviewer

Journals:

- IEEE Transactions on Pattern Recognition and Machine Intelligence (PAMI)
- International Journal of Computer Vision (IJCV)
- Computer Vision and Image Understanding (CVIU)
- PLOS ONE

Conferences:

- IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2012, 2013, 2015, 2016, 2018
- IEEE International Conference on Computer Vision (ICCV) 2011
- European Conference on Computer Vision (ECCV) 2016
- IEEE Winter Conference on Applications of Computer Vision (WACV) 2018
- IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS) 2012
- Asian Conference on Computer Vision (ACCV) 2012

TEACHING EXPERIENCE

At Boston University:

Teaching Assistant, CS542 Machine Learning, Fall 2017

Teaching Fellow, CS591-S2 Deep Learning, Spring 2017

Teaching Fellow, CS542 Machine Learning, Spring 2016

Teaching Fellow, CS542 Machine Learning, Spring 2015

Teaching Assistant, CS542 Machine Learning, Spring 2013

Teaching Fellow, CS103 Introduction to Internet Technologies and Web Programming, Spring 2012

REFERENCES

Available upon request.