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Shell Xu Hu

Research Interests

Machine Learning	Probabilistic Graphical Models, Structured Prediction, Deep Generative Models
Computer Vision	3D Scene Semantization, Object Recognition, Hierarchical Image Modeling
Others	Computational Neuroscience, Bayesian Statistics, Optimization, Graph Theory

Education

2015.3–present	PhD in Machine Learning and Computer Vision , <i>École des Ponts ParisTech</i> , France.
2012.9–2015.3	Master in Computer Science , <i>Oregon State University</i> , USA.
2011.9–2012.9	Master in Computer Vision and Artificial Intelligence , <i>Universitat Autònoma de Barcelona</i> , Spain.
2006.9–2010.7	Bachelor in Software Engineering , <i>Hangzhou Dianzi University</i> , China.

Projects

2014.5–2014.10	Structured Output Learning with Approximate Inference , <i>Google Summer of Code 2014 with Shogun Machine Learning Toolbox</i> . <ul style="list-style-type: none">Proposed the project, which was motivated by the needs of approximate inference in many structured prediction applications.Worked as the mentor of the project.Helped to implement GraphCuts and linear programming relaxation algorithms.Helped to conduct experiments including image denoising and semantic segmentation.
2013.7–present	Tree Cutting for Semantic Segmentation , <i>Oregon State University</i> . <ul style="list-style-type: none">Proposed a latent hierarchical tree model for scene labeling.Proposed a dynamic programming algorithm for finding MAP solutions as well as cutting the tree into various numbers of subtrees.
2013.5–2013.10	Large Scale Learning of General Structured Output Models , <i>Google Summer of Code 2013 with Shogun Machine Learning Toolbox</i> . <ul style="list-style-type: none">Implemented the factor graph model and the MAP inference framework.Implemented online structured SVM solvers: stochastic gradient descent and block-coordinate Frank-Wolfe algorithm.IPython notebook link: http://nbviewer.ipython.org/6865729.

- 2012.11–2015.3 **Next Generation Phenomics for Tree of Life**, *Oregon State University*.
- Proposed a reconfigurable part model for encoding structural variations among species.
 - Proposed a zero-shot learning algorithm for transferring learned models between species.
 - Co-developed a search-based structured prediction for detecting biological characters.
- 2011.10–2012.9 **Towards Real-Time Part-Based Pedestrian Detection**, *Universitat Autònoma de Barcelona*.
- Implemented the histogram-of-gradients feature on GPU.
 - Implemented a coarse-to-fine inference scheme for hierarchical part-based models.
 - Developed a real-time pedestrian detection system.
- 2010.5–2011.9 **Kinect Interactive Multimedia Platform**, *Hangzhou Dianzi University*.
- Developed a figure-ground video segmentation algorithm based on GraphCuts for Kinect videos.

Papers

- M. Pedersoli, S. X. Hu, J. Gonzalez and X. Roca, **Towards a Real-Time Pedestrian Detection based only on Vision**, IEEE Transactions on Intelligent Transportation System, 2014.
- S. X. Hu, M. Lam, S. Todorovic, T. G. Dietterich, A. Cirranello, P. Velazco, N. Simmons, M. O’Leary, **Zero-Shot Learning and Detection of Teeth in Images of Bat Skulls**, ICCV Workshop on Computer Vision for Accelerated Bioscience, 2013.
- M. Q. Lam, J. R. Doppa, S. X. Hu, A. Reft, S. Todorovic, T. G. Dietterich, M. Daly, **Learning to Detect Basal Tubules of Nematocysts in SEM Images**, ICCV Workshop on Computer Vision for Accelerated Bioscience, 2013.
- J. Xu, S. Ramos, S. X. Hu, D. Vázquez and A. M. López, **Multi-task Bilinear Classifiers for Visual Domain Adaptation**, NIPS Workshop on New Directions in Transfer and Multi-Task: Learning Across Domains and Tasks, 2013.
- S. X. Hu, C. Jiang, W. Zhang, J. Zhang, R. Yu, C. Lv, **An Event Based GUI Programming Toolkit for Embedded System**, APSCC, 2010.
- Y. Zhao, C. Jiang, S. X. Hu, **Remote Sensing Image Processing Based On CUDA Platform**, IEEE International Conference on Remote Sensing, 2010.

Work Experience

- 2010.7–2011.7 **Research Engineer**, *Grid and Service Computing Lab, Hangzhou Dianzi University*.
- Developed a web GUI for Xen virtual machine resource monitoring.
 - Co-developed a GPU Accelerated remote sensing image processing system.
- 2009.10–2010.4 **Intern**, *Huawei Technologies Co. Ltd.*.
- Worked as a tester.
- 2008.11–2009.5 **Intern**, *NewMsg Technologies Co. Ltd.*.
- Developed a Chinese input method for the wireless hand-held device.

Teaching Experience

- Fall 2011 **Teaching Assistant**, *Fundamentals of Informatics*, Department of Computer Science, Universitat Autònoma de Barcelona, Spain.

Programming Skills

Languages C/C++ (advanced), Matlab (advanced), Python (intermediate) etc.
Tools Vim (advanced), Git (advanced), Latex (advanced), Shogun (intermediate), CUDA (intermediate), OpenCV (intermediate), OpenGL, Qt, Kinect SDK, CMake etc.

Awards

2009 **Outstanding Undergraduate Student Research Award**, *School of Computer Science and Software Engineering, Hangzhou Dianzi University.*
2008 **Second Prize**, *China Undergraduate Mathematical Contest in Modeling.*
2009 **Successful Participants**, *Mathematical Contest in Modeling Contest.*

Coursework

- Artificial Intelligence
- Theory of Statistics
- Applied Stochastic Models
- Convex Optimization
- Introduction to Graphical Models
- Bayesian Statistics
- Computer Vision and Machine Learning
- Approximate Algorithms