Contact

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Research Interests

Machine Learning and its applications in Computer Vision, Medical Image Processing and Natural Language Processing.

Educations

Sep, 2008 – Jul, 2014	PhD at i-Vision Group, Dpt. of Automation, Tsinghua University. Supervisor: Jie Zhou.
Sep, 2005 – Mar, 2008	Master Degree of Telecommunication Engineering, Beijing University of Posts and Telecommunications (BUPT). Supervisors: Fei Su and Anni Cai.
Sep, 2001 – Jul, 2005	Bachelor Degree of Telecommunication Engineering, Wuhan University of Technology (WHUT). Rank 2 of 200+.

Experiences

Aug, 2015 – Aug, 2016 (expected)	Post-doctoral researcher, Dpt. Of Statistics, Rutgers University. Host: Tong Zhang • Character-level and word-level one-hot neural network applied to text classification • Medical image segmentation based on deconvolutional neural network
Sep, 2014 – Aug, 2015	Post-doctoral researcher, Medical College, Cornell University. Host: Guanglei Xiong and James K. Min • 3D heart pose estimation from CT volume based on end-to-end trained cascade pose regression • Vessel segmentation based on 3D convolutional neural network • Machine learning approach for blood pressure (Fractional Flow Reserve , FFR) prediction from CT volume based on graph model
Jul, 2013 – Apr, 2014	Intern at Institute of Deep Learning, Baidu Inc. Mentor: Tong Zhang and Kai Yu. • Multi-threading code for LogitBoost algorithm • Investigation of sampling classes for multi-class Boosting • Theoretical analysis of convergence rate for LogitBoost
Oct, 2011 – Apr, 2012	Visiting student at Australia National University and NICTA. Advisors: Mark Reid and Robert Williamson. • Loss function and numeric optimization of Boosting

Programming Language

C++, CUDA C, Matlab, Python, Lua

Projects and Code

- One-Hot Convolutional Neural Network for text classification (Lua, Torch 7, CUDA C)
  - One-Hot convent module. Link
  - Text classification main logic. Link
- CT volume segmentation based on 3D convolutional neural network (Matlab, CUDA C, VTK, ITK)
  - Neural Network Computational Graph (DAG), a common library. Link
  - Vessel segmentation from 3D CT volume. Link 1, Link 2
- 3D heart pose regression based on end-to-end trained cascade pose regression. Link
- Machine learning approach to blood pressure (FFR) prediction from CT volume based on graph model and local regression (Matlab, Python, VTK) Link
- Adaptive One-vs-One LogitBoost software package(C++, Matlab, OpenCV, TBB). Link
- A demo for video shot boundary detection and video retrieval based on SIFT feature (C++, OpenCV, DirectShow). Sub-program of Key Technologies Research and Development Program of China, 2009BAH40B03. Around 2011.
- Leading developer of BUPT group for Fingerprint Verification Contest 2006 (FVC 2006) (C++, OpenCV). Around 2006.
- Miscellaneous… see my github and Matlab file exchange

Papers
- **Peng Sun**, Tong Zhang, Jie Zhou. "A Convergence Rate Analysis for LogitBoost, MART and Their Variant". **ICML2014**
- **Peng Sun**, Mark D. Reid, Jie Zhou. "An Improved Multiclass LogitBoost Using Adaptive-One-vs-One", Machine Learning (**MLJ**), 2014, 97(3): 295-326.
- **Peng Sun**, Jie Zhou. "Saving Evaluation Time for the Decision Function in Boosting: Representation and Reordering Base Learner", **ICML 2013**.
- **Peng Sun**, Mark D. Reid, Jie Zhou. "AOSO-LogitBoost: Adaptive One-Vs-One LogitBoost for Multi-Class Problems", **ICML 2012**.
- Mark D. Reid, Robert C. Williamson, **Peng Sun**. "The Convexity and Design of Composite Multiclass Losses", **ICML 2012**.
- **Peng Sun**, Yinan Na, and Jie Zhou. "A novel algorithm for cut shot boundary detection." Seventh International Symposium on Multispectral Image Processing and Pattern Recognition (**MIPPR2011**). SPIE, 2011.

Technical Reports
- **Peng Sun**, James K. Min, Guanglei Xiong. "Globally Tuned Cascade Pose Regression via Back Propagation with Application in 2D Face Pose Estimation and Heart Segmentation in 3D CT Images." http://arxiv.org/abs/1503.08843, 2015
- **Peng Sun**, Haoyin Zhou, Devon Lundine, James K Min, Guanglei Xiong. "Fast Segmentation of Left Ventricle in CT Images by Explicit Shape Regression using Random Pixel Difference Features". http://arxiv.org/abs/1507.07508, 2015

Professional Activities
- Registered reviewer for Journal of Machine Learning Research (JMLR), Machine Learning (MLJ), IEEE Transaction on Image Processing (TIP) and ICML 2016
- Invited talk at Learning to Rank Team, Division of Page Searching, Baidu Inc., Oct 2013.