Yijun Huang, Ph.D.

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OBJECTIVE

A data scientist position uitlizing data mining, machine learning, and optimization skills to build the next generation of data driven products.

EDUCATION

Volunteer Research Assistant, Machine Learning, Data Mining, Optimization
University of Rochester, United States   2014-Present

Volunteer Research Assistant, Machine Learning, Optimization
University of Wisconsin-Madison, United States   2013-2014

Doctor of Engineering, Mechanical and Electrical Engineering
Chinese Academy of Sciences, Shenyang Institute of Automation, China   2005-2010
Thesis - 3D Reconstruction from Multiple Views

Doctor of Engineering: Course Study
University of Science and Technology of China   2005-2006

Bachelor of Engineering, Automation
Nankai University, China   2001-2005

WORKING EXPERIENCES

Volunteer Research Assistant   2014 - Present
University of Rochester, United States
- Develop machine learning models and optimization algorithms for big data problems: feature selection, analyze social media data and medical longitudinal data for healthcare, active learning.
- Develop AsynML: an asynchronous parallel algorithm package for solving some popular machine learning problems on multi-core / multi-socket systems.

Volunteer Research Assistant   2013 - 2014
University of Wisconsin-Madison, United States
- Develop an asynchronous parallel framework on multi-core / multi-socket system to implement optimization algorithms: deep learning, linear regression, SVM, logistic regression, linear system.

Senior Software Engineer   2010 - 2013
Tianjin Jinhang Institute of Computing Technology, China

- Develop image/video applications in embedded system: path planing for aircraft, real-time infrared target recognition and tracking system, real-time communication system, electronic image stabilization system.

Research Assistant   2006 - 2010
Chinese Academy of Sciences, Shenyang Institute of Automation
- 3D modeling / reconstruction, digital camera calibration, and digital visualization.

PUBLICATIONS

- H. Wang*, **Y. Huang***, J. Liu, H. Huang, "New Balanced Active Learning Model and Optimization Algorithm". (* equal contribution. under review)
- X. Lian, H. Zhang, C.-J. Hsieh, **Y. Huang**, and J. Liu, "A Comprehensive Linear Speedup Analysis for Asynchronous Stochastic Parallel Optimization from Zeroth-Order to First-Order", NIPS, 2016.
- **Y. Huang** and J. Liu, "Exclusive Sparsity Norm Minimization with Random Groups via Cone Projection", 2015. ArXiv:1510.07925 (under review).
- **Y. Huang**, Q. Meng, J. Liu and S. Huang "CHI: A Contemporaneous Health Index for Disease Monitoring using Longitudinal Data", 2016. (under review).
- H. Yang, **Y. Huang**, L. Tran, J. Liu and S. Huang, "On Benefits of Selection Diversity via Bilevel Exclusive Sparsity", CVPR, 2016.
- X. Lian, **Y. Huang**, Y. Li, J. Liu, "Asynchronous Parallel Stochastic Gradient for Nonconvex Optimization", NIPS, 2015.
- J. Zhao, R. Xia, W. Liu, J. Xu and **Y. Huang**, "Research on Volume Measurement Technology for Rail Tanker Based on Computer Vsion", International Conference on Mechatronics and Applied Mechanics, 2011.
- F. Yang, W. Liu and **Y. Huang**, "A Method of Automatic Wheel Identify and Classify", Chinese Journal of Microcomputer Information, 2010.
- **Y. Huang** and W. Liu, "Robust Estimation of the Fundamental Matrix Based on LTS and Bucketing", International Conference on Wavelet Analysis and Pattern Recognition, 2009.
- **Y. Huang**, W. Liu and J. Zhao, "Metric Reconstruction Based on Multifocal Tensors", IEEE International Conference on Intelligent Computing and Intelligent Systems, 2009.
- **Y. Huang**, W. Liu and J. Zhao, "An Approach to Metric Reconstruction Based on Trifocal Tensor", Chinese Journal of Scientific Instrument, 2009.
- **Y. Huang** and W. Liu, "A Method for Fundamental Matrix Estimation Using LQS", Journal of Image and Graphics, 2009.

PATENTS

- **Y. Huang**, W. Liu and J. Zhao, "An Approach to Metric Reconstruction Based on Trifocal Tensor", Cn101750029a, 2009.
- J. Zhao, R. Xia, W. Liu, **Y. Huang**, "An Approach on volume measurement technology for rail tanker based on computer vision", Cn101629805, 2010.

PROJECTS

Machine learning and optimization algorithms development for big data problems 07/2013 - Now

Project 1: Work with multiple big and complex data sources (from soucial media, health record, business survery, biomedical data, etc), utilize machine learning techniques to build predictive models to meet the pratical needs, and solve these models by designing efficient optimization methods.
- Develop two kinds of sparse feature selection methods: a bilevel exclusive sparsity algorithm which is to pursue the diversity by restricting the numbers of important features in the overall scale and in each feature group; an exclusive sparsity norm minimization method which is to pursue a sparse solution by making the importmant features evenly distributed in different feature groups.
- Develop a range regression algorithm for ordinal labeling problems.
- Develop a predict method for contemporaneous patient risk monitoring by combining longitudinal data that reflect the degeneration of the health condition.
- Analyze Twittes and implement a label propagation method to predict users' health statuses.

Project 2: Develop an asynchronous parallel software framework for multi-core / multi-socket server to implement parallel optimization algorithms / solvers for big data problems in machine learning and scientific computing.
- Build an unlocked asynchronous parallel software framework to manage distributed storage and distributed processing on the multi-core / multi-socket server (Intel Core / Intel Xeon), based on NUMA and POSIX Pthread libraries.
- Implement some popular asynchronous parallel optimization algorithms for big data problems: deep learning, linear system, SVM, LASSO, Logistic regression, etc.

Embedded system development   06/2010 - 05/2013

Project 3: Design a PCIe device for efficient path planning computing.
- Designed and validated multiple image processing algorithms for path planning on PC.
- Implemented these algorithms on FPGA (mainly Xilinx Virtex-6) in Verilog.
- Developed parallel implementations of these algorithms on Nvidia GPU for the purpose of comparison to the FPGA implementations.

Project 4: Build a real-time infrared target recognition and tracking device for aerocraft navigation.
- Designed multiple real-time infrared target recognition and tracking algorithms.
- Implemented these algorithms on DSP (TI TM320c64x, TI TM320c67x, ADSP210).

Project 5: Develop real-time embedded control/communication devices for aviation applications.
- Developed embedded softwares on DSP/ARM for: interfacing with devices (SPI, UART, 1553 bus, and Ethernet interface); testing hardware models; and implementing protocol stacks (e.g., UDP/IP).

Project 6: Develop embedded EIS (Electronic Image Stabilization) system.
- Developed multiple efficient image deblurring algorithms to compensate for video device shake.
- Implemented these algorithms on DSP/ARM.

Graphics and Computer Vision   07/2006 - 06/2010

Project 7: Develop a 3D modeling system to reconstruct and visualize the target object from an image sequence.

- Proposed an algorithm to obtain a 3D digital model of the target object from an image sequence (This algorithm improves the traditional Space Carving methods);
- Proposed an efficient method for constructing the 3D visual hull.

Project 8: Develop an image-based volume measurement system for rail tankers.

- Proposed a high accuracy 3D reconstruction algorithm for our applications;
- Calibrated cameras;
- Proposed a uniform reconstruction framework based on multifocal tensors.

HONORS

- Rank 1 (1/200+) of National Higher Education Entrance Examination, Tianjin 32rd High School   2001
- Outstanding Student Scholarship, Nankai University   2005

SKILLS

Solid background and rich experiences of data analytics, machine learning, optimization, computer architecture, image processing and graphics.

Programming languages: proficient in C\C++ (10 years +), matlab (7 years +) and R & Python (2 years +); experienced in Java and Verilog.

Development Experiences: POSIX Multi-threads Programming (3 years +), Hadoop & Spark (1 year+), TI's DSP and ADI's ADSP (2 years +), ARM (2 years +), Xilinx FPGA (2 years+), NVIDIA GPU (1 year +), OpenCV (3 years+), OpenGL (2 years+) and GUI (Qt, MFC) (3 years+).

Others: experienced in SQL, OpenMP, Communication protocols (1553, TCP, UDP, UART).

Languages: Mandarin and English.