

Hongjun Jia

Current address: Columbus, OH, Relocation: Yes, Available date: March, 2009 (earlier date negotiable)
Cell phone: (614) 260-0696, Email: jia.22@osu.edu, Homepage: <http://www.ece.osu.edu/~jiah>

OBJECTIVE

Seeking a fulltime position from a company that can benefit from my excellent problem-solving ability and extensive knowledge and experience in the fields of computer vision, image/video processing and pattern recognition.

EDUCATION

- **The Ohio State University**, Columbus, OH, USA
Ph.D. Electrical and Computer Engineering, 03/2009, GPA: 4.00/4.00, Minor: Mathematics.
- **Tsinghua University**, Beijing, P.R. China
M.E. (with honor) Electronics Engineering, 08/2004, GPA: 86/100, Award of Best Master's Thesis.
- **Tsinghua University**, Beijing, P.R. China
B.E. (with honor) Electronics Engineering, 08/2001, GPA: 89/100.

RESEARCH EXPERIENCE

Research Associate, Computational Biology and Cognitive Science Lab, the Ohio State University, 09/2004 – present

- Built a **3D mesh model** for human head to facilitate the visualization of head motion and the verification of face reconstruction with OpenGL and Visual C++.
- Proposed a **3D object reconstruction** algorithm with a novel Deviation Parameter criterion which measures the sub-dataset based on matrix perturbation theory and random matrix theory. Improved the performance of the most popular structure-from-motion algorithm significantly and handled up to 50% missing data and much larger noise successfully. Published several papers in the top journal and conference in this field.
- Developed two new algorithms for **Face Recognition**: Support Vector Machines based algorithm and Partial Within-Class Match algorithm. Implemented them in Matlab and C++. Solved the problem of recognizing faces from a dataset with partial faces, which could be hardly resolved before. Extended the application scope of face recognition tremendously and achieved much higher recognition rate.
- Participated in the team work of **hand gesture / facial components detection** and **hand shape / facial expression analysis** in the projects funded from NIH and NSF.
- Implemented the image segmentation algorithm of Non-Parametric Normalized Cut in C and Matlab.
- Constructed a **video-based hand shape recognition system** and applied it in a labyrinth game in Matlab and C.

Research Associate, Digital Video and Intelligent Surveillance Lab, Tsinghua University, China, 09/2001 – 08/2004

- Developed a series of new algorithms for **motion estimation in H.264 video coding**. These methods speeded up the inter-frame motion estimation process up to 55%. Published several papers in top journal and conferences which have been cited more than 30 times. Invited report on related topics was given in other universities in China.
- Proposed a new one-pixel-wide **edge detection** method based on local accumulative histogram.
- Worked on robust edge detection, image segmentation, image enhancement and other image processing techniques on **medical images**, e.g. MRI and CT.

INTERN EXPERIENCE

Embedded System Engineer (part-time), Tsinghua Tongfang Co. Ltd., Beijing, China, 05/2000 – 08/2001

- Designed the on-screen display system and the file download system on STi5512-based DVB-C Set Top Box.
- Tested and debugged codes from other groups.

Intern of Software Engineer, Beijing Institute of Control Engineering, Beijing, China, 07/2000 – 09/2000

- Led a four person team on designing and coding prototype software for Electronic Components Simulation System with Visual C++.
- Prepared part of the software-related documents as a project of the course of software engineering.

PROFESSIONAL KNOWLEDGE

- **Computer Vision, Image Processing and Signal Processing**: Multiple View Geometry, Stereopsis, Structure from Motion/Shading, Camera Calibration, Edge Detection, Object Segmentation/Clustering, Image Analysis, Computational Geometry, Computer Graphics.
- **Pattern Recognition/Classification and Machine Learning**: Support Vector Machines, Discriminant Analysis, Component Analysis, Kernel Methods, Linear/Nonlinear Regression, Multivariate Analysis, Boosting Algorithms, Decision Tree, Graph Theory.

SKILLS

- **Programming**: proficient in C/C++, Matlab, Pascal, hands-on experience on OpenGL, Java, Assembly Language;
- **Computer**: familiar with MS DOS, Windows, MS Office, AutoCAD, HTML, LaTeX;
- **Personal**: highly organized and self-motivated team-player.

TEACHING EXPERIENCE

Instructor for Switch Circuit Laboratory, Dept. ECE, the Ohio State University, Columbus, OH, 01/2006 – 06/2007

- Instructed over 150 junior/senior students in five (5) consecutive quarters (Student evaluation: 4.6/5.0).
- Taught basic lab operation, gave lectures on digital circuit design and graded the lab reports.
- Updated the lab books and handouts.

Grader for Systems and Signals I, Dept. ECE, the Ohio State University, Columbus, OH, 09/2005 – 12/2005

- Helped more than 70 students in the office hours on the homework and graded quizzes and mid-terms.

Teaching Assistant for Digital Image Processing, Dept. EE, Tsinghua University, Beijing, China, 03/2001 – 07/2001

- Designed and graded the course project; Answered questions in the office hours.

PUBLICATIONS

- **H. Jia** and A.M. Martinez, "Support Vector Machines in Face Recognition with Occlusions," submitted to the IEEE Conf. on Computer Vision and Pattern Recognition, 2009.
- **H. Jia** and A.M. Martinez, "Low-Rank Matrix Fitting Based on Subspace Perturbation Analysis with Applications to Structure from Motion," IEEE Transactions on Pattern Analysis and Machine Intelligence, accepted, 2008.
- **H. Jia** and A.M. Martinez, "Face Recognition with Occlusions in the Training and Testing Sets," in Proc. of the 8th IEEE Int'l Conf. on Automatic Face and Gesture Recognition (FG 2008), the Netherlands, 2008.
- **H. Jia** and L. Zhang, "Directional Cross Diamond Search Algorithm for Fast Block Motion Estimation," arXiv: 0806.0689v1 [cs.CV], 2008.
- **H. Jia**, J. Fortuna and A.M. Martinez, "Perturbation Estimation of the Subspaces for Structure from Motion with Noisy and Missing Data," in Proc. of the 3rd Int'l Symposium on 3D Data Processing, Visualization and Transmission, pp.1101-1107, North Carolina, 2006. [NSF award, oral report]
- **H. Jia** and L. Zhang, "A New Cross Diamond Search Algorithm for Block Motion Estimation," in Proc. of the IEEE Int'l Conf. on Acoustics, Speech, and Signal Processing 2004 (ICASSP 2004), vol.3, pp.357-360, Canada, 2004.
- **H. Jia** and L. Zhang, "Directional Diamond Search Pattern for Fast Block Motion Estimation," IEE Electronics Letters, Vol.39, No.22, pp.1581-1583, 2003. [25+ citations]
- **H. Jia** and L. Zhang, "One-pixel Wide Edge Detection Algorithm Based on Local Accumulative Histogram," in Proc. of SPIE - the 2nd Int'l Conf. on Image and Graphics 2002, vol.4875, pp.283-290, China, 2002. [Oral report]

OTHER EXPERIENCE

- **Reviewer**, 2004 – present: Reviewed papers for the major conferences and journals: IEEE Trans. on Pattern Analysis and Machine Intelligence, Image and Vision Computing, Journal of Zhejiang University-SCIENCE A, IEE Proc. Vision, Image and Signal Processing, IEEE Conf. on Computer Vision and Pattern Recognition, Int'l Conf. on Pattern Recognition, Int'l Conf. on Intelligent Computing, Int'l Conf. on Computer Vision
- **Arrangement Co-Chair**, Cultural Festival of Graduate Student of Tsinghua University, 2002: Responsible for ensuring deadlines and goals were met in timely manner and coordinating manpower and resources
- **Director**, Office of Student Union, 1999 – 2000: Created and maintained schedules and member activities

COURSEWORK

- **Software/hardware**: Programming Foundations, Software Engineering, Data Structure for C, C++ Programming, Introduction to Hardware Description Language and FPGA, Parallel Processing Technology of Image
- **Signal Processing**: Information Theory, Random Processes and Applications, Signal Detection and Estimation, Digital Signal Processing
- **Computer Vision and Pattern Recognition**: Computer Vision, Pattern Recognition, Digital Image Processing, Image Understanding, Computer Graphics and 3D Animation, Fundamentals of Computer Aided Design
- **Mathematics**: Numerical Analysis Algorithms, Numerical Optimization, Mathematical Principles in Science, Linear Algebra, Complex Function Analysis, Functional Analysis Foundations

HONORS AND AWARDS

- Distinguished University Fellowship of The Ohio State University, 2004 – 2008
- Full member of Sigma Xi, the honorary scientific research society, 2008
- Student member of the IEEE, 2002-2008, and the ACM, 2008
- National Science Foundation Student Travel Grant for the 3rd International Symposium on 3DPVT, 2006
- Award of the Best Master's Thesis of Tsinghua University, 2004
- Outstanding Graduate Student Scholarship of Tsinghua University, 2002 – 2004
- Third Prize of Mathematical Modeling Competition of Tsinghua University, 2000
- Outstanding Student Scholarship of Tsinghua University, 1998 – 2001
- Member of National Training Team for Intl. Math. Olympics (20 from entire China) , 1997

References will be provided upon request.