

# YANFEI LIU

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## RESEARCH INTEREST

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Robotics, especially industrial robotics, Dynamic manipulation, Computer vision and image processing

## EDUCATION

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### Doctor of Philosophy in Electrical Engineering

Clemson University, Clemson, SC, USA

Focus area: Intelligent Systems (Control/Robotics)

August 2004

GPA: 3.9/4.0

### Master of Engineering

Institute of Automation

Focus area: Control Theory and Engineering

Chinese Academy of Sciences, Beijing, China

GPA: 3.5/4.0

July 1999

### Bachelor of Engineering

Shandong Institute of Architecture and Engineering

Major: Industrial Automation

Jinan, China

GPA: 3.5/4.0

July 1996

## RESEARCH EXPERIENCE

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### Clemson University

January 2000 - current

#### Research assistant

- Worked as a primary graduate student on “Vision-Based Dynamic Industrial Workcell” project (<http://www.ces.clemson.edu/~ahoover/workcell/>), conducting research using an industrial manipulator and its conventional controller
- Performed research in the area of robotics, dynamics manipulation, computer vision and visual sensing systems
- Worked for four years on a Staubli RX-130 industrial manipulator and its standard CS-7 controller
- Programmed proficiently in V+ language, popularly used in current industrial robotics
- Worked on image acquisition programming using IFC5.0 software library for PC-RGB framegrabber
- Conducted TCP/IP socket programming in Visual C++ and V+
- Presented a new generic timing model for Vision-based Robot Systems, applied this timing model to our industrial workcell and achieved good performance
- Performed research in dynamic manipulation with objects moving in semi-structured trajectories
- Designed and built a novel pneumatic robot hand and conducted grasping research using this hand
- Authored several publications with colleagues

### Institute of Automation, Chinese Academy of Sciences

September 1996 – July 1999

#### Research assistant

- Presented a new two-layer coded Genetic Algorithms and applied to mobile robot path planning

- Applied Genetic Algorithms into solving the inverse of Jacobian matrix for two-link manipulators

**Shandong Institute of Architecture and Engineering**

April 1996 –July 1996

*Research assistant*

- Designed an intelligent controller of Heating Transfer Machine

**TEACHING EXPERIENCE**

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**Clemson University**

January 2000 – current

Grader

- *Signals and Systems*, Spring 2000, Fall 2000, Spring 2001  
Responsibility included preparing homework solutions, grading homework and quizzes.
- *Communication Systems*, Spring 2000  
Responsibility included preparing homework solutions, grading homework and quizzes.
- *Continuous and Discrete Systems*, Fall 2001, Spring 2002  
Responsibility included preparing homework solutions, grading homework.
- *Fundamentals of Robotics*, Spring 2001, Spring 2002, Fall 2003  
Responsibility included preparing homework solutions, grading homework.
- *Circuits*, Spring 2002, Summer I 2004  
Responsibility included holding office hours, preparing homework solutions, grading homework and quizzes.

**CLASS PROJECTS (computer vision, image processing)**

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- Character Recognition
- Range Image Segmentation
- Edge Extraction, Equalization
- Optical flow determination
- Linux Kernel patching and installation

**SKILLS**

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**Computer**

- Operating Systems: Windows NT/2000, Unix (Solaris), Linux
- Networks: Socket level programming in Windows and V+
- Program Languages: C/C++, Matlab, Maple, Fortran, HTML, 8086/8098 Assembly
- Software Package: Scientific Workplace, Corel Draw, Adobe Premier, Microsoft Office

**Language**

- English: fluent in speaking and writing
- Chinese-Mandarin: native language

**PUBLICATIONS**

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**Journal**

- Y. Liu, A. Hoover and I. Walker, “**A Timing Model for Vision-Based Control of Industrial Robot Manipulators**,” *IEEE Transaction on Robotics*, Vol. 20, No. 5, pp. 891-898, Oct. 2004
- Y. Liu, A. Hoover and I. Walker, “**Dynamic Intercept and Manipulation of Objects under Semi-Structured Motion for an Industrial Robot Workcell with Visual Guidance**,” submitted to *IEEE Trans. on Robotics* in Sept. 2004

## Conference

- Y. Liu, A. Hoover and I. Walker, “**Sensor Network Based Workcell for Industrial Robotics**,” in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 1434-1439, Hawaii, USA, Oct. 2001
- Y. Liu, A. Hoover and I. Walker, “**Experiments Using a Sensor Network Based Workcell for Industrial Robots**,” in *Proc. IEEE Int. Conf. Robotics and Automation*, pp. 2988-2993, Washington, USA, May 2002
- Y. Liu, A. Hoover and I. Walker, “**A New Generic Model for Vision Based Tracking in Robotic Systems**,” in *Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 248-253, Las Vegas, USA, Oct. 2003

## PRESENTATIONS

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- “**Experiments Using a Sensor Network Based Workcell for Industrial Robots**,” in *IEEE Int. Conf. Robotics and Automation*, Washington, USA, May 2002
- “**A New Generic Model for Vision Based Tracking in Robotic Systems**,” in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Las Vegas, USA, October 2003

## HONORS AND PROFESSIONAL ORGANIZATIONS

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- The first prize scholarship, Shandong Institute of Architecture and Engineering, China, 1992-1996
- Best graduate award, Shandong Institute of Architecture and Engineering, China, 1996
- Excellent graduate award, Institute of Automation, CAS, China, 1999
- Member of IEEE Robotics and Automation Society in IEEE, 2001-present

## REFERENCES

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Dr. Ian Walker (Dissertation advisor)  
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Clemson University  
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