Xiaoming Li

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Xiasha Higher Educational Zone,
Hangzhou, China, 310018

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RESEACH STATEMENT

The field I was working on is called Mechatronics, which is engineering oriented, cross disciplinary and adaptable. It aims to build economic, reliable, and high-performance products with the integration of principles from mechanics, electronics, control, computer engineering and information theory. The research on Mechatronics covers a lot of fields, such as motion control, embedded system, machine vision, PLC, mechanics, control theory, Industry robot, automation, etc. I am now currently working on ITS (Intelligent Transportation System) and IoT(Internet of Things).

My research experiences can be described by following keywords: motion control, fluid-power transmission and control, mobile robotics, UAV, computer vision, human-machine system, embedded system, distributed computing, software engineering, computer vision and Mechatronic system integration. My current research focuses on two areas: (1) software engineering for mechatronic system, information system and IOT (Internet of Things) and (2) target object shape rebuild and identification based on computer vision. I am now very interested in Machine Learning and Computer Vision, which I believe are very important to design and build intelligent machines in the future.

EDUCATION

Institute of Mechatronic Control Engineering, **September 1998 -- September 2004**
(State Key Lab of Fluid Power Transmission and Control)
Zhejiang University,
Hangzhou, China (310027)
http://sklofp.zju.edu.cn/
Ph.D degree in 2004
Major: Mechanical Engineering

School of Mechanical Engineering, **September 1993 -- July 1998**
Xi'an Jiaotong University,
Xi'an, China (710049)
http://mec.xjtu.edu.cn/
Bachelor degree in 1998
Major: Mechatronics Engineering

Foreign business office, **September 1995 -- February 1997**
Xi'an Jiaotong University,
Xi'an, China (710049)
Minor major: Sino-US International Business Management

No. 1 Middle School of Shengli Oil Field **September 1990 -- July 1993**
Shandong Province,
China (257050)

PROFESSIONAL EXPERIENCE

CTO **January 2017 -today**
Hangzhou Newer Technology Co. Ltd
http://www.hznewer.com

-Leader of the R&D group
-Development of Management Information System for City Public Bicyle System

Associate Professor / Master's Supervisor **September 2013 - today**
Zhejiang Sci-Tech University
http://www.zstu.edu.cn

-Teaching and Scientific Research
-Supervisor of Excellent undergraduate students
-Adviser for under-graduate students on course selection
-Supervising the postgraduate students
-Arduino based Engineering Training Course for freshman

September 2015 - December 2015

Visiting Scholar, Department of Computer Science and Engineering

University of Texas, Arlington.
Arlington, Texas, USA
http://cse.uta.edu

--Computer vision and machine learning
--Deep learning on medical image processing
--Survival model
--Cooperate professor: Junzhou Huang

Chairperson, Department of Mechatronics **December 2012 - September 2013**
Zhejiang Sci-Tech University
http://www.zstu.edu.cn

-Responsible for teaching activity administration and subject construction.

Visiting Scientist, Department of Computer Science and Engineering **October 2011 - December 2012**
Texas A&M University, College Station, TX, USA
http://engineering.tamu.edu/cse/

- Research on the autonomous landing area discovery for UAV
- Cooperate Supervisor: Professor Robin R. Murphy

Associate Chairperson, Department of Mechatronics,
Zhejiang Sci-Tech University, **September 2010 -- October 2011**
http://www.zstu.edu.cn

-Responsible for teaching activity administration and subject construction.

Lecturer / Associate Professor / Master's Supervisor **September 2004 -- Spetember 2010**
Zhejiang Sci-Tech University,
http://www.zstu.edu.cn

-Teaching and Scientific Research
-Director of the University RoboCup Team
-Adviser for under-graduate students on course selection
-Supervising the postgraduate students
-Scientific counselor of regional economic industries of Zhejiang Province

Senior Software Engineer
Concent Limited, Shenzhen **October 2001 – March 2003**

-Part-time job
-Developed a full P2P based OA Groupware Platform for Enterprise business. In Charge of the Whole System Design, Object Oriented Analysis, Jxta Study
-System developed using Java

Technical Director / Manager
Hangzhou Speed Software Development Ltd
May 2000 – June 2001

-Part-time job
-Developed a TeleCom GIS system for management of telecommunication devices.
-The Oracle and Visual C++ are used during the developing period.
-This system has been installed in LiShui telecom bureau of Zhejiang province, China

Software Engineer
China R&D Group, Sanei Ltd Japan **June 1999 – March 2000**

-Part-time job
-Providing advice on system design
-Testing all kinds of algorithms which would be used in the Road Design CAD System.

Awards

Video Monitoring Data Storage and Management System Based on Unix **2005**
second prize of Zhejiang provincial science and Technology Award **No. 0502021-3**

Digital manufacturing technology and equipment for shoemaking **2008**
second prize of Zhejiang provincial science and Technology Award **No. 0802069**

LIST OF RESEARCH PROJECTS

- Research and Development of module based assembling software framework for instruments. Industry funded. **Jan 2015 - Jun 2016**
- Data management, analysis, evaluation and simulation software tools for control system. Industry funded. **Aug 2014 - Jan 2015**
- Feature extraction and Man-made Object Identification from less informative image sequences. Industry funded. **Apr 2014 - Dec 2015**
- 3-Dimension structure reconstruction of target object based on image sequence. Industry funded. **Dec 2013 - Apr 2014**
- Design of automatic large size silk screen fault detection equipment based on computer vision. Supported by the Science and Technology Department, Zhejiang Provincial Government. **Jan 2007 – Mar 2010**
- Research and implementation of synchronized motion control method for hydraulic catapult system. Supported by Natural Science Foundation of China **Jan 2007 – Dec 2009**
- Research on the synchronized motion control method of multi-cylinders on heavy-load high-speed hydraulic system. Supported by Zhejiang Provincial Natural Science Foundation **Jan 2006 – Dec 2007**
- Exploratory research on the training model of undergraduate students by taking the advantages of scientific research in mechatronic institute. Supported by academic administration, Zhejiang Sci-Tech University **Jan 2008 – Dec 2008**
- Research on the Internet-based tele-operation by using the exoskeleton technology. Main part of my doctoral thesis. **2002 – 2004**

LIST OF PAPERS

[1] **LI Xiaoming**, XIAO Yao. Arduino CommShell, An Interactive Tool for Mechatronic Classroom Teaching. 6th International Coference on Education, Management, Commerce and Society (EMCS2016), Shenyan, China. Jan 1-3 2016.
[2] **LI Xiaoming**. Using Arduino to Introduce the Concepts of Mechatronics to College Fresh-Persons. 6th International Coference on Education, Management, Commerce and Society (EMCS2016), Shenyan, China. Jan 1-3 2016.
[3] CHEN Jian, LI Xiao ming, SU Bi da, et al. Calculation method of motion trajectory for mobile robot based on SFM. Journal of Mechanical & Electrical Engineering, 2015,32(11):1524-1528. (in Chinese)
[4] Bo Tu, **Xiaoming Li**, Lingyun Ye, etc. Standard facilities with high precision using master meter method. Jounrnal of Mechanical and Electrical Engineering, 32(3), 2015. Pp307-311. (in Chinese)
[5] Fei Yan, **Xiaoming Li**, Bo Tu. Android based Remote Control System for Mobile Robot. Journal of Mechanical and Electrical Engineering, 31(2), 2014. Pp 261-264. (in Chinese)
[6] **Xiaoming Li**. A Software Scheme for UAV's Safe Landing Area Discovery. AASRI Procedia 4 (2013), 2013 AASRI Conference on Intelligent System and Control. Pp 230-235 (Language: English)
[7] Rui Li, **Xiaoming Li**. Control System of Miniature Mobile Robotic Platform Based On Mobile-Android. Journal of Mechanical and Electrical Engineering, 30(11), 2013. Pp 1414-1429 (Language: Chinese)
[8] Minhang Zhu, **Xiaoming Li**, etc. The Biped Robot with the System of Object Identification. Equipment Manufacturing Technology, 2012(4), 2012. Pp 8-11. (Language: Chinese)
[9] Ming Wang, Xiao Zhao, **Xiaoming Li**. Wireless Communicatioin System Design of Small Scale Soccer Robot Based on FPGA. Journal of Mechanical and Electrical Engineering, 28(11), 2011. Pp 1386-1390. (Language: Chinese)
[10] Guangwei Liu, Shangwen Ruan, Linagyao Su, Huiling Gao, Yong Chang, **Xiaoming Li**. Remote Communication System of Domestic Robot based on GPRS Network. Journal of Mechanical and Electrical Engineering, 28(11), 2011. Pp 1396-1399. (language: Chinese)
[11] Mingxiong Li, Xiao Zhao, **Xiaoming Li**. Velocity measurement system of small size soccer robot in RoboCup. Journal of Mechanical and Electrical Engineering, 28(2), 2011. pp 198-201. (language: Chinese)
[12] Dexiao Fu, **Xiaoming Li**. Development of open simulation system for robot soccer. Journal of Mechanical and Electrical Engineering, 28(1), 2011. pp 55-59. (language: Chinese)
[13] Yanli Zhu, **Xiaoming Li**. BP neural network based image segmentation technique for small sized leaguer soccer robot team system. Journal of Mechanical and Electrical Engineering, 28(1), 2011. pp 79-83. (language: Chinese)
[14] **Xiaoming Li**. Web Based Remote Video Monitoring System Implemented Using Java Technology. Proceedings of 2010 2nd International Conference on Information and Multimedia Technology, ICIMT2010, Hong Kong, China. 2010.
[15] **Xiaoming Li**, Mingxiong Li. An embedded CAN-BUS communication module for measurement and control system. Proceedings of 2010 International conference on E-product E-service E-entertainment, ICEEEE2010, Henan China, 2010.
[16] **Xiaoming Li**, Liangliang Xiao, Chenchen Sun. General software model for motion control based on visual basic developing environment. Mechanical and Electrical Engineering Magazine, 26(12), 2009. pp 50-53. (language: Chinese)
[17] Liangliang Xiao, **Xiaoming Li**, Xiaojing Mao. Analysis of multi-axis synchronization motion systems based on virutal

line-shaft control. Electrical Automation, 31(6), 2009. pp 5-7. (language: Chinese)
[18] Chenchen Sun, **Xiaoming Li**. Algorithms for image matching based on projection with adaptive threshold. Journal of Mechanical and Electrical Engineering Magazine, 26(11), 2009. pp 65-67. (language: Chinese)
[19] Liangliang Xiao, **Xiaoming Li**, Yifeng Hu. Design of multi-axis motion synchronization control system based on CAN bus. Journal of Mechanical and Electrical Engineering Magazine, 26(11), 2009. pp 9-12. (language: Chinese)
[20] **Xiaoming Li**, Pengxiang Li. Research on the virtual axis motion synchronization control mythology for high speed hydraulic systems. Chinese Hydraulics and Pneumatics, 2008(11). (language: Chinese)
[21] Jingchang Yan, **Xiaoming Li**. Control System of Synchronous Motion of High Speed Hydraulic Multi- cylinder Based on CAN Bus. Hydraulics Pneumatics & Seals, 2008(2): pp35-38. (language: Chinese)
[22] **Xiaoming Li**. Bilateral Control of A Internet Based Tele-operation System with Force Reflection. Proceedings of 2007 IEEE International Conference on System, Man and Cybernetics. Oct, 2007. pp 2272-2277.
[23] **Xiaoming Li**, Yuzhen Jin, Xudong Hu. An XML-Driven Component Based Software Framework for Mobile Robotic Applications. Proceedings of the 2nd IEEE/ASME International Conference on Mechatronics and Embedded Systems and Applications, Aug. 2006. pp298-303.
[24] **Xiaoming Li**, Ying Chen, Jianci Zhang, Jianhua Gao. A Pneumatic Force Reflector in Bilateral Control System. Proceedings of International Conference on Fluid Power Transmission and Control (ICFP2005). April, 2005, pp 849-853.
[25] **Xiaoming Li**, Canjun Yang, Ying Chen. Open architecture for internet based Tele-robotic system. Chinese Journal of Mechanical Engineering, 17(3), 2004. pp 372-376.
[26] **Xiaoming Li**, Canjun Yang, Ying Chen. A new control architecture for Internet based tele-robotic system using server-push technique. Acta Automatica Sinica, 30(4), 2004. pp 597-600. (Language: Chinese)
[27] **Xiaoming Li**, Canjun Yang, Ying Chen, Xudong Hu. Hybrid event based control architecture for Tele-robotic systems controlled through Internet. Journal of Zhejiang University SCIENCE, 5(3), 2004. pp 296-302.
[28] Xiaoming Li, Canjun Yang, Ying Chen, Li Xu. The design of mobile robotic guide system for library. Laser & Infrared, 2000(2), pp 56-57. (language: Chinese)

TEACHING

- **Post-Graduate Level**
  - Advanced Computer Control System
  - Electro-Hydraulic Control Technique for Mechatronical Equipment
  - Computer Control System and the Interfacing Technology
- **Under-Graduate Level**
  - Electro-Mechanical Transmission and Control
  - Database System and Design
  - Software Design Methodology for Mechatronical System
  - Mechatronical System Design
  - Database and Database Management System
- **Student RoboCup Research Team Supervisor**
  - Study group formed by undergraduate students
  - RoboCup Small Sized League
  - Build the RoboCup Team from Scratch (hardware and software)
- **Arduino Training**
  - Freshman oriented program
  - Introduce basic mechatronic ideas to mechanical engineering students

R&D EXPERIENCES

Component based software development platform for modular instrumentation systems **April 2015 - July 2016**

- Hardware Configuration
  -Modular instrumentation hardware
  -Embedded System
- Project Description

Design a software system used by users of the instrumentation system to develop their own applications in an easy way. It should be able to support the graphical programming method, and all the fundamental functions should be given in the form of components.The software should be running on the specific hardware platform designed by provider.

- Features
  - Component based Software Engineering
  - XML was used as the programming language
  - Complete software architecture which can adapt to the growing of the hardware system
- Responsibility
  - Teaming leader
  - Software System Architect
  - Platform Kernel design and implementation

Data analysis, evaluation, simulation software for control system. **Aug 2014 - Jan 2015**

- Hardware Configuation
  -Workstation

■ Project Description
-Software tool to import data from various sources, to store them in the nested database, to analyze them using Matlab functions and charts, to evaluate the performance according to the data, and generate the report automatically.
-Software should be extendable, customizable, support secondary development.
■ Features
-XML was used to support the plugin-development
-JFreeChart was used to display curves
-Java RCP was adopted as the framework
-SQLite as the database
-Pentaho Report engine was adopted to generate the report automatically
-Matlab JA was adopted to integrate the matlab function into the software
■ Responsibility
-System design, software development, software test.

3D reconstruction of an object from a photo sequence by SFM **Dec 2013 - Apr 2014**

■ Hardware Configuration
-Single Camera
■ Project Description
-Get the 3D point cloud of a specified object using SFM technology
-Camera calibration using chessboard
-A demo program included
-Implemented using OpenCV and Java
■ Responsibility
- System design, algorithms design, system implementation, test

A vision based autonomous landing area recognition method for UAV **Apr 2012 - Oct 2012**

■ Hardware Configuration
-Helicopter type Unmanned Aerial Vehicle (UAV)
-Single on-board camera beaming downward
■ Project Description
-Find places suitable for landing while the UAV traveling to the destination, record the GPS locations, and chosen one in case of emergency landing request received;
-Recognize the suitable landing spot by processing the feeding camera data
-Use computer vision to locate the candidates for landing, and evaluate them using machine learning method;
-System is developed based on OpenCV
-The candidates of landing areas are located based on texture features, to find a suitable surface to land on;
-The optic flow has been adopted to ensure the candidates are geometrically flat;
-The candidates are classified by a Naive Bayesian classifier.
■ Responsibility
- System design, algorithms design, system implementation, test

An XML driven component based mobile robotic software framework design and implementation **Oct 2006 - Mar 2014**

■ Hardware Configuration
-Mobile robots with wireless network
■ Project Description
-A software framework for mobile robotic system;
-All functions are implemented by modules, and the platform load modules according to its description in an XML file on the run-time;
-Modules are communicating with each other through pipes, which are also described in the XML configuration file, and can be loaded dynamically;
-Platform includes a real-time clock and a task scheduler, so that it allow real-time tasks to be executed; The real-time task is encapsulated in real-time module;
-User can change the XML file to get different task oriented mobile robotic control software.
■ Responsibility
- System design, architecture design, system implementation

Implement of an omnidirectional mobile robot platform for outdoor purpose **Oct. 2005 – Jul 2006**

■ Hardware Configuration
-DC servo motor, SICK Laser Range Finder, Wireless Serial Ports
-PMAC motion controller
-Laptop (PC)
■ Software

-Java, JNI and C++
- Project Description
  -Building a platform for further research on mobile robotics
  -Layered structure and cylinder shape, diameter is 1 meter
- Responsibility
  -System integration and control software design

Centralized Real Time Video Storage System For Intelligent Transportation System **May 2003 – May 2004**

- Software Environment:
  -AIX Unix / Red Hat Linux / Windows / Oralce9i
- Hardware Environment:
  -Main Frame Computer
- Project Description:
  -As part of the Intelligent Transportation System, video data is usually so precious that it should be preserved for later reference. This is what this project for.
  -The model of the system is centralized, including three parts: real time video data storage subsystem, video data management subsystem and playback subsystem, which are built on different operation systems and different techniques.
- Responsibility:
  -Project Manager.

Texture Image Segmentation

June 2002 – September 2002

- Development Tools:
  - Visual C++, C++
- Project Description
  - utilizing pattern recognition theory in texture image segmentation
  - Algorithms: Gabor Filter
- Responsibility:
  - Algorithm design and program development

P2P technology based Group ware for OA

June 2002 – October 2002

- Software Environment:
  - Java Platform
- Project Description:
  - A new generation OA system for Business based on P2P network
  - Based on JXTA platform
  - Emphasis on Cooperation
- Responsibility:
  - Design the Platform system.
  - Programming.
  - Mastering the Jxta technology.

Remote Control Platform for Tele-Robotic system

June 2002 – October 2002

- Development Tools:
  - Java
  - JCreator
- Project Description:
  - A new architecture was developed for Internet based Tele-Robotic System. In this architecture, HTTP and Server Push technology was used in Remote Data Acquisition, while embedded CGI program was used for control channel.
  - This frame work is suitable for general purposed on line control system through Internet
- Responsibility:
  - System Design
  - Software Development and Realization

Real time Foreground Image Segmentation in Color Image Series

March 2002 – July 2002

- Software Environment:
  - Windows
- Hardware Environment:
  - Image Frame Grabber
- Development Tools:
  - Visual C++
- Project Description:
  - Segmentation of human being silhouette from the complex background images
- Responsibility:

- Design, Realization, Programming and Installation

Laboratory Network Administration **September 2000 – September 2003**

- Software Environment:
  - Linux
- Project Description:
  - Laboratory Network Administration, including Configuration and monitoring of Apache web server, Ftp Server, Squid Proxy Server and other servers.
- Responsibility
  - Network security, stableness and urgent recovery.

Tele-GIS Project **June 2000 – October 2001**

- Software Environment:
  - Windows
- Development Tools:
  - Visual C++
  - MapX
  - Oracle DB
- Project Description:
  - A GIS System for Telecom Circuit Device Management. Oracle DB was used to store device attributes, MapX was used to show graphically the location of each device. Visual C++ is the fundamental tools.
- Responsibility:
  - Program Coding, Debugging and Installation.

Road CAD system **June 1999 – March 2000**

- Software Environment:
  - Windows, AutoCAD
- Development Tools:
  - Visual C++, Object ARX, AutoCAD14&2000, UML
- Project Description:
  - Do some pre-research jobs about the Road CAD system, mainly about Algorithm design and experiments.
- Responsibility:
  - Programmer

STUDENTS UNDER MY DIRECTION

Graduate Students

- HUANG, Wenjian; HUANG, Renqiang. (2016-)
- HE, Bin; FANG, Yue; LIU, Yan (2015-)
- HUANG, Li; ZHANG, Zhizhong (2014-)
- CHEN, Jian (2013-2016)
- TU, Bo (2012-2015)
- LI, Rui; YAN, Fei (2011-2014)
- SUN, Chenchen; ZHOU, Xiaowei; SUN Yongqi (2010-2013)
- ZHAO, Xiao; WANG, Ming. (2009-2012)
- GONG, Jinchao; ZHU, Yanli; LI, Mingxiong; FU, Dexiao. (2008-2011)
- XIAO, Liangliang; QIN, Fenglin; SUN, Chenchen. (2007-2010)
- TAO, Xiaojun; FENG, Jialiang (2006-2009)
- YAN, Jingchang (2005-2008)

Undergraduate Students

- LIANG, Jiancai; WANG, Xingguo; GAO, Liyi. (2014)
- ZHU, Minhang; Wang, Xingxing; Chen, Jianfei(2013)
- ZHANG, Renhui, YANG, Kai; XIE, Sendong (2011)

SPARETIME ACADEMIC JOBS

Reviewer

- Journal of Mechanical and Electrical Engineering (in Chinese language)
- China Mechanical Engineering (in Chinese language)
- Journal of Zhejiang Sci-Tech University (in Chinese language)
- Journal of Zhejiang University (Engineering Science) (in Chinese language)

ENGLISH ABIILITY TESTING INFORMATION

- TOEFL(IBT)

Date of Test: 12/03/2012(mm/dd/yy) Score: Reading 29 Listening 23 Speaking 20 Writing 22
Total: 94

- IELTS

Date of Test: 02/23/2013 (mm/dd/yy) Score: Oral: 5.5 Reading 7.5 Writing 7 Listening 7
Total: 7.0

- PETS5

Date of Test: 12/17/2005 (mm/dd/yy) Score: Reading & Writing: 69 Listening: 20 Oral: 4
Total: 93
