

## Wenshan Wang

Cellphone: (+86)135-8573-1373

E-mail: shanshan1370@sina.com

Homepage: [www.wangwenshan.com](http://www.wangwenshan.com)

Seeking for position: Research position related to **robotics, reinforcement learning, automated planning or deep learning**



### Education

➤ **SHANGHAI JIAO TONG UNIVERSITY**

Major in Mechatronics, Robotic Institute

Dr. En

Mar. 2017

Thesis: Task Planning for Ubiquitous Robotic Systems in Complex Environments

➤ **EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Major in Mechanics and Automation, Minor in Applied Mathematics

B.En

Jun. 2009

### Project Experiences

- Deep learning for robot mapping and navigation. Research Intern at Microsoft Research Asia. (2017)
  - Designing joint learning architecture for pixel-level prediction tasks such as optical flow, stereo and segmentation.
  - Developing robot navigation algorithm based on reinforcement learning and predictive model.
- Deep learning for object recognition and voice recognition. Research Intern at Pico China Ltd. (2016-2017)
  - Developed applications of object recognition and voice recognition using open source deep learning frameworks.
- The Study of Ubiquitous Robotic Technology and its Software Modules.  
Source: Cooperated with Yaskawa Electrical Corporation (2014-2015)
  - Designed and implemented the **ubiquitous robotic system** based on Robot Technology Middleware (RTM) and Robot Operating System (ROS).
  - Proposed a **hierarchical task planning algorithm** based on Markov Decision Process (MDP) model.
- The Robotic Modularization Techniques.  
Source: The National High Technology Research and Development Program of China (2013-2015)
  - Investigated the state of the art **robotic software modularization techniques**, and proposed a national standard on "Robotic Software Functional Component".
- Team leader of the standard platform league of Robocup soccer contest (2013-2014)
  - In charge of **multi-agent coordination**, task planning based on hierarchical finite state machine.
- The Study of Programming Environment for Intelligent Robots.  
Source: Cooperated with Yaskawa Electrical Corporation (2011-2012)
  - Proposed an algorithm for **auto-creation of topological map** with a probabilistic map build with the laser sensor.
  - Developed a **robot navigation** method for **multi-layered** environment based on A\* algorithm.

### Technical Skills

- **Programming:** Proficiency in using Matlab, C/C++, Java, Python, Cuda, C#, JavaScript and Html.
- **Robot Hardware Platforms:** Solid experiences in programming with Nao (Aldebaran), SDA5 (Yaskawa), Baxter (Rethink Robotics), UR10/UR5 (Universal Robots). Familiarity with embedded system design using Arduino and STM32.
- **Robot Software Platforms:** Highly skilled in embedded programming. In depth knowledge of Robot Operating System (ROS) and Robot Technology Middleware (RTM).
- **Artificial Intelligence Related:** Extensive knowledge of reinforcement learning, hierarchical reinforcement learning, Monte Carlo tree search, and automated planning. Highly experienced in Caffe and Tensorflow.

## Research Interests

- ☆ **Automated Planning:** Task planning for problems in large state space with uncertainties. Hierarchical planning based on the MDP model.
- ☆ **Deep Neural Networks:** Robot mapping, environment understanding using DNNs.
- ☆ **Reinforcement Learning:** End to end learning for robot perception, control and actuation based on deep reinforcement learning.

## Publications

- [1] **Wenshan Wang**, Xiaoxiao Zhu, Liyu Wang, Qiang Qiu, Qixin Cao, Ubiquitous Robotic Technology for Smart Manufacturing System, Computational Intelligence and Neuroscience, 2016.
- [2] **Wenshan Wang**, Qixin Cao, Qiang Qiu, Gilbert Cheruiyot. Online learning of task models for ubiquitous robotic systems, IAS14, 2016, In press.
- [3] Qixin Cao, **Wenshan Wang**, Xiaoxiao Zhu, Chuntao Leng, Study on Ubiquitous Robotic Systems for Smart Manufacturing Program, IASO2016, In press.
- [4] **Wenshan Wang**, Qixin Cao, Modeling for Robot Task Planning based on Light-weighted Markov Decision Process, Journal of Huazhong University of Science and Technology, 2015, 43(S1): 58-61.
- [5] **Wenshan Wang**, Qixin Cao, Xiaoxiao Zhu, Shuang Liang, A Framework for Intelligent Service Environments Based on Middleware and General Purpose Task Planner, 2015 International Conference on Intelligent Environments (IE), IEEE, 2015, pp. 184-187.
- [6] **Wenshan Wang**, Qixin Cao, Xiaoxiao Zhu, Masaru Adachi. An automatic switching approach of robotic components for improving robot localization reliability in complicated environment. Industrial Robot: An International Journal, 2014, 41(2): 135-144.
- [7] **Wenshan Wang**, Qixin Cao, Chengcheng Deng, Zhong Liu, Auto-Creation and Navigation of the Multi-area Topological Map for 3D Large-Scale Environment, LSMS/ICSEE 2010, pp. 307-315.

## Honors and Awards

- Outstanding winner in Standard Platform League of Robocup China Open (Team leader) Oct. 2014  
- Framework design, behavior control and multi-robot cooperation
- First Prize in Standard Platform League of Robocup China Open (Team leader) Oct. 2013  
- Framework design, behavior control and multi-robot cooperation
- Dr. scholarship for outstanding new student Sept. 2011
- Second Prize in Middle Size Robot League of Robocup China Open (Team award) Dec. 2009  
- Behavior control
- Second prize in the International Collegiate Mathematics Modeling Contest Dec. 2008
- Third Prize in National Collegiate Smart Car Contest Aug. 2008  
- Computer vision and motor control
- Bronze Medal in ACM Programming Contest (Asia Site) Nov. 2007
- Second prize in the National Collegiate Mathematics Modeling Contest (Shanghai Site) Sept. 2007
- School Outstanding Student 2005, 2006