

# ZHENG Fan 郑帆

PhD candidate

Mechanical and Automation Engineering, The Chinese University of Hong Kong

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## Education

- Bachelor, Mechatronic Engineering, Zhejiang University 2010-2014
- PhD, Mechanical and Automation Engineering, The Chinese University of HK 2014-2017

## Research Interest

- State estimation for robotics, visual inertial navigation, visual SLAM

## Project Experience

*Humanoid Football Player Development* 2012-2014  
Zhejiang University

- Our team, *ZJUDANCER*, develops kid-size humanoid football player robots
- My work is to design robot mechanical structure, build 3D model in SolidWorks, draw machining drawings and contact with manufacturers for parts manufactory, assemble and maintain the robots. I'm the mechanical group leader in 2013-2014
- Championship in 2013 RoboCup China; Top 8 in 2014 RoboCup in Brazil

*Tactile Sensors Test Platform Development* 2013-2014  
Zhejiang University

- My final year project, developing a mechatronic platform with 3-D translation and 3-D rotation, which can precisely move the stimulator tip to execute test work of required motion on tactile sensors
- I worked on both the hardware and software development of the platform

*Visual Estimation for Ground Vehicles* 2014-2017  
The Chinese University of Hong Kong

- My PhD thesis topic is to develop a robust odometry/IMU assisted visual SLAM system for navigation of ground vehicles

## Working Experience

*Robotics Intern* 2013  
Atlas Copco (Wuxi)

- Develop a robotic arm prototype for deburring compressor rotors
- Design a six-servo robotic arm model with my partner; achieve the algorithm for inverse kinematics; program in Arduino for control motion; program in Qt to create interface

## Publication

Journal Papers

- **F. Zheng**, H. Tang, Y.-H. Liu. *Odometry-Vision-Based Ground Vehicle Motion Estimation With  $SE(2)$ -Constrained  $SE(3)$  Poses*. IEEE Transactions on Cybernetics, 2018. [DOI:10.1109/TCYB.2018.2831900]

## Conference Papers

- **F. Zheng**, Y.-H. Liu. *A Geometric Model for Fusing IMU into Monocular Visual Localization of 3-D Mobile Robots*. IEEE International Conference on Real-time Computing and Robotics, 2016. [DOI:10.1109/RCAR.2016.7784043]
- Lu Y, Liu Y, Wang Z, **Zheng F**. *Lens-free And Portable Quantitative Phase Microscope Using A Dual-pinhole Aperture*. International Symposium on Optomechatronic Technologies. International Society for Optics and Photonics, 2015. [DOI:10.1051/mateconf/20153204002]

## Teaching

- TA, MAEG 3010 Mechanics of Materials 2014/2015
- TA, MAEG 4050 Modern Control and Theory 2014/2015
- TA, MAEG 5755 Robotics 2015/2016

## Social/Voluntary Work

- Student helper, IEEE ROBIO 2014 international conference 2014
- Student ambassador, HKPFS Summer Workshop of Engineering Faculty, CUHK 2015

## Honors

- National Scholarship 2012
- Championship in 2013 RoboCup China, Humanoid Kidsize 2013
- Top-8 Team in 2014 RoboCup, Humanoid Kidsize 2014
- Hong Kong PhD Fellowship 2014

## Skills

- Languages: Mandarin Chinese, Teochew (native); English, Cantonese (fluent)
- Programming: C++ (Qt, ROS, OpenCV, Eigen, g2o, Ceres Solver), Python, MATLAB
- Softwares: MS Office, SolidWorks; Bash, Vim, LaTeX, CMake, GDB