Li Dongda

Gender: Male
Date of birth: 05/08/1993
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Education

School of Automation and Information Engineering
Xi'an University of Technology **09/2011-06/2015**
B.S., major in Automation
Advisor: Yingming YI
Specialized courses included automatic control theory, signal and system analysis, motion control technology, computer control technology, sensor technology, C++ language, embedded system, circuit theory, etc.

Research Experience

Research Assistant **08/2016-Present**
The Department of Compute Science
The University of HongKong
Supervisors: Francis C.M. Lau, Yuexuan Wang and Heming Cui
Research Area: Robotic Network, Wireless Sensor Network, Internet of Things

Research Assistant **07/2016-07/2017**
Unmanned Aerial Vehicle Autonomous Control Institute
Beijing Institute of Technology
Supervisor: Defu Lin
Research Area: Unmanned Aerial Vehicle Control System, Navigation System, Data Fusion

Work experience

Embedded Software Engineer **07/2015-06/2016**
Beijing Zhonghangzhi Technology Co., Ltd
Responsibilities: Design of new unmanned helicopter flight control software.
Include hardware BSP development, operating system transplantation and application, navigation algorithm design, etc.

Publication

- **Published paper**
  - Dongda Li, Yuexuan Wang, Zhaoquan Gu, Tong Shen, Tianhao Wei, Yongqin Fu, Heming Cui, Mingli Song, Francis C. M. Lau. Adler: A Resilient, High-Performance and Energy-Efficient UAV-Enabled Sensor System. http://www.cs.hku.hk/research/techreps/document/TR-2018-01.pdf. 2018-01

- **Under review**
  - Augmenting Wireless Sensor Networks with Unmanned Aerial Vehicles. Submitted to SenSys 2018
  - Malak: An Intelligent, High-performance and Resilient Software Defined Wireless Sensor Network System. Submitted to Mobicom 2018

Research Projects:

◆ **Software Defined Wireless Sensor Network System** **12/2017-03/2018**

Project Description: Software defined networking (SDN) makes implementations of many techniques (e.g., artificial intelligence, or AI) easy, and in turn these techniques greatly improve the performance and resilience of SDN. Unfortunately, SDN systems have not yet been implemented in actual wireless sensor networks (WSNs), only in simulators.

In this project, we present Malak, the first practical SDN implementation for WSNs, which achieves intelligence, high performance and resilience simultaneously. We use a set of unmanned aerial vehicles (UAVs) to serve as Malak's SDN controllers. In Malak, sensor nodes communicate through UAVs within one-hop communication ranges, and they communicate in a traditional multi-hop manner when UAVs are not around. This new routing protocol greatly improves the throughput of a WSN and sensor nodes' energy efficiency. Malak includes easy-to-use SDN interfaces, and we have implemented five SDN applications, namely routing, multitask, network diagnosis, AI energy exhaustion prediction, and AI node selection.

This work has been submitted to the Mobicom 2018 for review.

◆ **UAV-Enabled Sensor System** **08/2017-11/2017**

Project Description: Sensor networks have been widely studied, but implementing a real system that achieves resilience, high performance and energy efficiency simultaneously is still a challenging task. We present Adler, a real unmanned aerial vehicle (UAV) enabled sensor system that can meet that challenge for general applications. We demonstrate Adler in three fundamental applications: localization, gathering and network reconfiguration. Evaluation results validate Adler's ability to achieve resilience, high performance and energy efficiency. Using Adler's application program interfaces (APIs), it is easy to evaluate algorithms for a pure sensor system or a UAV-enabled sensor system. More importantly, Adler has the potential to realize global optimization in a distributed sensor system, which is a promising feature for a software-defined sensor network or a large-scale Internet-of-Things (IoT) network.

◆ **MBZIRC-2017 International Robotic Competition** **01/2017-03/2017**

UAV to locate, track and land on a moving vehicle automatically (Champion)

Project Description: The challenge requirement is that the target vehicle is traveling at a speed of 15km / h, the UAV needs to automatically take off, and locate landing marker on the moving vehicle, then track and land at target location on the moving vehicle. We completed software design based on the Robot operating system(ROS) running on Airborne processor, and the project is divided into three

parts, including vision detection, tacking control and landing control. the vision system detecting the landing mark on the moving vehicle, proportional guidance with impact angle constraints algorithm is used for tacking control, so we can ensure that the aircraft lands quickly and steadily on the moving vehicle.

Duty Description: UAV tacking control, landing control and software integration.

- **Autonomous takeoff and landing of the intelligent quadrotor**(Thesis)

Start and end time： **12/2014-06/2015**

Project Description: The drone is controlled by an adaptive control algorithm to improve stability and immunity of the system (this part is the angle closed-loop attitude control to achieve), and further, through the altitude controller to achieve altitude closed-loop, utilize the positioning controller to achieve the location closed loop, and then the drone can take off and landing automatically.

The work is based on STM32F4 hardware platform, and using MPU9250 as IMU, Through the Inertial navigation algorithm to obtain the attitude, adaptive control algorithm to control quadrotor.

Duty Description: Schematic design, PCB design, software design, algorithm debugging.

- **Visual tracking gimbal system design** **08/2014-11/2014**
- **Simulated Flight Control System Based on SINS** **08/2013-12/2013**
- **Two-wheel self-balancing vehicle** **11/2012-06/2013**
- **AVR-based multi-function smart vehicle** **08/2012-11/2012**

Professional skills

- Familiar with the principle of inertial navigation, integrated navigation algorithm and application, can be carry out aircraft attitude calculation and control algorithm design;
- Master Matlab control system modeling and simulation capabilities;
- Familiar with Robot operating system(ROS) programming and application;
- Master the C / C + +/Python language, data structure, with good code preparation habits;
- Master micro-controller programming and debugging capabilities, with 5 years of embedded system development experience.
- Familiar with IOT system design and programming.
- Master the Linux system programming;
- Familiar with GIT and Academic Writing;

Awards

Champion Mohamed Bin Zayed International Robotics Challenge (MBZIRC) 2017. 03/2017

Grand Prize The eighth Shaanxi province outstanding graduation design 06/2015

Second Prize Xi'an University of Technology, 2014 Emerson "CONSIDER IT SOLVED" 08/2014

Outstanding Officer of Automation Technology Association, Xi'an University of Technology 05/2013

First Prize The 21st session of the " Innovation Prix" science and technology competition 11/2012

Research Interests

Robotic Control and Navigation, Motion Planning, Robotic Network