Lu Yaokun

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Educational

- **University of Electronic Science and Technology of China(UESTC)**
  M.S. in Signal and Information Processing, July 2019
  Thesis: "Research on Moving Object Tracking of Visual Target Under Complex Scenario"
  Supervisor: Professor Peng Zhenming
- **University of Electronic Science and Technology of China(UESTC)**
  B.S. in Optical Information Science and Technology, June 2016

Honors

- July 2015, The 14th ROBOCON National First Prize (National Champion) (Badminton Robot)
- August 2015, National College Student Electronic Design Competition, National Second Prize (Autonomous Line Patrol Flying UAV)
- August 2014, National Optoelectronic Design Competition, National Second Prize (non-contact measurement of complex surface objects)
- Won the second-class scholarship for the people and the first-class scholarship for postgraduate studies. 2 individual patents.

Research Experiences

2018.05-2019.2 **Tencent AI-lab** **Research Assistant**

- Internship with Dr. Ling Yonggen in the Vision Group of Tencent AI Lab. In terms of the complex operation of the current vslam back-end algorithm, the method of solving equations based on matrix QR decomposition was used to speed up the operation; the stability of the matrix to perturbation was enhanced, enabling the use of the half-precision type in the matrix, so as to use the FPU in the ARM chip to further speed up the operation. A set of backends were formed using the above method and applied to the VINS framework without using existing solvers such as ceres.

2016.10-2018.2 **Vision Processing Algorithm + Project Leader** **Visual Object Tracking**

- The project used the method based on Kernel Correlation Filtering (KCF) and combined with the TLD idea to write a set of tracking algorithms to realize the fast and stable tracking of target vehicles and pedestrians in complex ground scenarios (changes of the appearance of the targets such as fast motion, motion blur, and shape change, as well as environmental changes such as noise interference, lighting changes, and low resolution) in the infrared/visible light band. In addition, functions of image enhancement and electronic image stabilization were also realized.
- Responsible for target tracking, writing of image enhancement algorithms, and the coordination of a 4-member team.

2014.9-2015.8 **Vision Processing Algorithm + Robot Motion Control** **Badminton Robot**

- The project predicted on the trajectory of the opponent's badminton by the robot, and commanded the robot to move to the landing point to fight back through reasonable trajectory planning. The robot has initially owned the ability to play badminton against humans. This project won the first prize of the 14th ROBOCON (national champion), and thus I have been interviewed by CCTV for many times and have been interviewed by state leaders such as Li Keqiang, Li Yuanchao and Liu Yandong. [news link]
- Responsible for capturing and predicting the visual algorithm of badminton trajectory. Used a high-speed binocular camera to calculate the position of the badminton, and used the Kalman filter to fit the trajectory and predict the landing point.

Work Experiences

2019.7-now **Didi** **Senior Algorithm Engineer**

- Participated in the R&D of core algorithms such as order distribution and estimated time of arrival (ETA) in the core international department of Didi. Quickly got familiar with the company and business, learned core technologies, won the outstanding newcomer award, and get promoted.
- In the transaction diversion scenario, diversion scenario was modelled from 0 to 1, and multiple scenario models were established and further developed. Finally, a cumulative business income of GMV+0.85% CR+0.26pp ECR+0.2pp was obtained, and a simple tree model was upgraded into a multi-objective deep cross model (DeepFM+ESMM). Multiple

optimizations were performed for the scenario, which greatly developed the potential of the data.

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- In the map ETA estimation, the ETA was provided in various data density scenarios, which provides an important support for calculating core scenarios such as the estimated price, the waiting time of passenger passthrough and the matching of order passengers.

2018.10-now **Yuanliu Automation Technology Co., Ltd.** **Founder**

- In terms of the problem of the high cost of calculating the actual number of plantings when the tobacco company formulates the plan for planting and replanting tobacco seedlings in mountainous areas, a method of collecting the images with tilt-rotor VTOL UAV was proposed, and the server used the collected images to count the number of tobacco seedlings. Finally, a complete set of tobacco field management system was formed and delivered to Guizhou Tobacco Company. As a main technician, I was responsible for image algorithms and UAV flight control software. Currently, the company has completed the high-tech enterprise certification, with a revenue of about 2 million yuan.
- Cooperated with the Science and Technology Association of the Academy of Aeronautics and Astronautics to establish a simple UAV production line. On the one hand, the production line has cultivated students' hands-on ability; on the other hand, as a mature flight experiment platform, it facilitates other teams of the college to perform scientific research with it.
- Obtained the terrain information near the tobacco field through terrain reconstruction after getting high-precision low-altitude UAV aerial survey photos. The information was used to operate terrain-following plant protection of mountain UAV, which has overcome the difficulty in the automatic UAV work in the mountains. At present, a service team has been formed and a small-scale test is being conducted.

Internships

2015.10-2016.4 **Shenzhen DJI Innovation Co., Ltd.** **Flight Control Algorithm Intern**

- Participated in embedded development in flight control (core department) (core position), and obtained core code authority. Deeply involved in the writing of flight control BSP and HAL layer codes.
- Proposed a set of standard process methods for barometer selection and comparison, which simplified the subsequent barometer selection and was praised by the leaders.
- Participated in the DEMO development and debugging of the flight control of the ADS-B aviation safety system, the core component of the Chinese airworthiness standard.
- Created the official routine of the STM32 version of the DJI open platform OnboardSDK, which has been provided to thousands of developers for learning currently.

Skills

- CET-6, NCRE (National Computer Rank Examination) Level-2, proficient in reading literature, documents and library files.
- Proficient in C/C++ and embedded development, familiar with OpenCV, Halcon image algorithm library and ROS robot operating system.
- Persistent pursuit of technology, strong comprehension ability, able to learn and master new languages and algorithms in a short time. Rich debugging experience and strong ability to identify, analyze and solve problems, able to release great potentials to complete tasks in a short period of time.