Yue Yang

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Educational Background

University of Pennsylvania (UPenn), School of Engineering and Applied Science Philadelphia, PA
Department of Computer and Information Science (GRASP Lab) 08/2018–12/2019
Master of Science in Engineering in Robotics (ROBO) Overall GPA: 3.95/4.00
Courses: *Machine Learning, Advanced Robotics, Artificial Intelligence, Machine Perception, Computer Vision*

Zhejiang University (ZJU), College of Energy Engineering Hangzhou, China
Power Machinery and Vehicular Engineering Institute 09/2014–06/2018
Bachelor of Engineering in Mechanical Design and Manufacture and Automatization
Overall GPA: 3.83/4.00 Major GPA: 3.87/4.00 Rank: 3/53
Courses: *Automatic Control Theory, Automobile Structure, Theory of Automobile.*

Professional Memberships
Affiliate Member, Institution of Mechanical Engineers (IMechE) 08/2017
Excellent Engineer Class, College of Energy Engineering, ZJU 05/2017

Research Experience

IMAGE CAPTIONING WITH YOLO OBJECT DETECTION Philadelphia, PA
Final Project in Machine Learning 10/2019–12/2019
- Developed an image encoder based on the penultimate layer of a CNN model (InceptionV3) for image features, combined with the output of object detection algorithm, YOLO (You Only Look Once).
- Completed the LSTM network as a decoder to train on the Flickr8K dataset to generate captions.
- Applied BLEU to evaluate the quality of the generated captions.

ROBOT VOICE CONTROL Philadelphia, PA
Independent Research 09/2019–11/2019
- Conducted the intent detection by converting the commands to vectors and compute the cosine similarity between commands and given categories.
- Implemented commands parser and slot filling of each command category.
- Developped speech to text function via Google Cloud Platform (GCP) and test the program on a sphero robot (R2D2).

DETECTION AND TRACKING OF OBJECTS IN VIDEO Philadelphia, PA
Group Project in Computer Vision 10/2019–11/2019
- Applied a Shi-Tomasi Corner Detector to select the feature points in the first frame of a video.
- Implemented the Kanade-Lucas-Tomasi (KLT) tracking procedure to track features and compute the optical flow between the successive frames.
- Improved the tracking performance via RANSAC to eliminate the outlier points and conducted an iterative feature recapture algorithm as a refinement of the KLT tracker.

VISION-BASED STATE ESTIMATION OF UAV Philadelphia, PA
Individual Project in Advanced Robotics 04/2019–05/2019
- Implemented a vision-based 3D pose estimator and velocity estimator which estimate position, orientation and velocity of the quadrotor using AprilTag.
- Completed a state estimation pipeline for the quadrotor by combining the pose and velocity estimators with the extended Kalman filter and validating it using data from VICON.

3D RECONSTRUCTION OF TWO 2D IMAGES Philadelphia, PA
Individual Project in Machine Perception 02/2019–04/2019
- Conducted camera calibrations using three orthogonal vanishing points.
- Made a RANSAC estimation of the essential matrix E and pose recovery (transformation R and T).

NONLINEAR CONTROL AND MOTION PLAN OF A QUADROTOR Philadelphia, PA
As Team Leader 01/2019–03/2019

- Conducted the nonlinear PD control of a quadrotor via the geometric method.
- Utilized the A star (A*) algorithm to find the shortest path between two points in a maze and applied the minimal snap trajectory to connect the waypoints generated by A*.
- Validated the programs by applying them to the real quadrotor, Crazyfile2.0.

AUTOMATIC OBSTACLE AVOIDANCE ROBOT CAR Philadelphia, PA
As the Championship Team Leader 11/2018–12/2018

- Developed the autonomous mode of the robot car by using ultrasonic sensors and compiled the obstacle avoidance algorithm using Arduino.
- The robot won the championship of Mechatronics 2018 Final Tournament at UPenn.

SIMULATION AND CONSTRUCTION OF A 3-RRR PARALLEL ROBOT Philadelphia, PA
As Team Leader 10/2018–12/2018

- Analyzed the FK and IK of the 3-RRR parallel robot and compiled the mathematical expression into MATLAB program to conduct the simulation.
- Constructed the robot by using laser cutting and then used the Arduino toolbox in MATLAB to control the robot in writing simple words and drawing geometric shapes.

SENSOR CONSTRUCTION OF A SPIRAL ZIPPER MANIPULATOR Philadelphia, PA
As a Research Assistant 09/2018–10/2018

- Developed the position sensor system of the Tether-tube robot, a 3 DOF parallel manipulator that serves as the arm of the whole project.
- Conducted the trajectory planning of this robot using the Robot Operating System (ROS).

NUMERICAL STUDY OF DEWING PHENOMENON ON VEHICLE WINDOW Hangzhou, China
As the First Author 11/2017–06/2018

- Analyzed condensation on vehicle windows via the EWF model using ANSYS Fluent.
- Discussed different working conditions to find the optimal working state for ensuring minimum condensation risk and passengers' comfort. The article has been collated by the 1st International Chinese Conference on Energy and Built Environment and was recommended for submission to the Journal of Sustainable Cities and Society (currently under review).

ANALYSIS ON THE INFULENCE OF GAP FLOW ON TRACTOR-TRAILERS Portorož, Slovenia
As the First Author/Speaker 11/2016–07/2017

- Conducted simulation research on gap flow around a tractor-trailer using ANSYS Fluent and analyzed the effect of area ratio and gap distance on its aerodynamic characteristics.
- Composed a paper on the analysis as First Author, which was presented at the 13th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT2017) in Portorož, Slovenia, where, as the youngest speaker, I delivered a presentation on the results.

Professional Experience

UNIVERSITY OF PENNSYLVIA Philadelphia, PA
Teaching Assistant of CIS-521 Artificial Intelligence 08/27–12/15

- Designed a Robot Navigation Assignment using BFS, DFS and A * searching algorithms.
- Designed a two-player flag capture adversarial searching game as the extra credit assignment, which applied the min-max algorithm to find the robots' optimal movements.
- Implemented auto-graders for testing on students' homework.

WEICHAI POWERCO LTD, HANGZHOU BRANCH OFFICE Hangzhou, China
Research Assistant in FEA 11/2017–01/2018

- Analyzed structural strength and temperature distribution of WP2 engine pistons.
- Applied Hypermesh to mesh generation and calculated temperature distribution using ABAQUS to provide suggestions on improving the structure.

Publications

- Yue Yang, Yuqi Huang and Jisheng Zhao. Numerical Study of the Dewing Phenomenon on Vehicular Window Glass, *1st International Chinese Conference on Energy and Built Environment*, *Applied Thermal Engineering* (recommended).
- Yue Yang, Jinxing Chen, Yuqi Huang*, Jiangang Chen and Yuan Ji. Analysis on the Influence of Gap Flow Around a Tractor-Trailer, *13th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2017)*.
- Yuan Ji, Jiangang Cheng, Jiaqi Xing, Yuqi Huang, Jinxing Chen and Yue Yang*, A CFD Study of Air Entrance's Influence on the Air Resistance of Ahmed Reference Body, *13th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT 2017)*. (*Author for correspondence.)

Honors and Awards

- Monash Graduate Scholarship (MGS) (AUD $28, 373), Monash University. 10/2019
- Elite Liu Yongling Scholarship, offered by Hong Kong Elite Industrial Development Group Co. Ltd. (Rank: 1/224). 08/2017
- Second-Class Scholarship for Outstanding Merit (Academic Year 2016–2017), ZJU. 09/2017
- Official Delegate of 32nd Student Congress, ZJU. 06/2017
- Third-Class Scholarship for Outstanding Merit (Academic Year 2015–2016), ZJU. 09/2016

IT & English Skills

- TOEFL:103 (Reading: 29, Listening: 26, Speaking: 23, Writing: 25).
- GRE: Verbal: 156, Quantitative: 170, Writing: 4.0.
- IT: Extensive knowledge of Linux, Python, ROS, MATLAB, C, SQL, and LaTex.
- Experience with machine learning tools: Pytorch, TensorFlow, Keras, nltk, Numpy, Pandas.
- Extensive knowledge of mechanical theories, particularly FEA and CFD. Experienced in FLUENT, ABAQUS, ANSYS, ICEM, AutoCAD and SolidWorks.

Activities

EXCHANGE PROJECT TO AUSTRALIAN INSTITUTES Sydney/Melbourne, Australia

Participated as a Student Delegate and Introducer 08/2017–09/2017

- Delivered speeches at Monash University, the University of Sydney and the University of Melbourne.
- Introduced the Power Machinery and Vehicular Engineering Institute as a representative and exchanged opinions in relevant areas with faculty members and students in the institutes visited.

EXCHANGE PROJECT TO UNIVERSITY OF ALBERTA Edmonton, AB, Canada

Visited the University of Alberta as a student delegate of ZJU 01/2015–02/2015