Jie Wang

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Mobile Robotics Researcher

I am a postdoctoral associate currently working on deep learning-based perception, path planning and controls for micro aerial vehicle (MAV) systems and used to work on modeling, controls, and simulations of a quadrupedal track-legged robot. I am excited about any technology that improves the autonomy of robotic systems, especially a combination of learning-based and model-based techniques.

Education

Doctor of Philosophy, Mechanical Engineering, June 2017
University of Calgary, Calgary, Alberta, Canada
Dissertation: *Autonomous Locomotion Mode Transition of Ground Hybrid Robots*
Supervisor: Dr. Alex Ramirez-Serrano

Bachelor of Engineering, Mechanical and Electrical Engineering, June 2011
Northwest A&F University, Xi'an, Shaanxi, China
GPA: 81.3/100

Awards

Research Assistant Scholarship, University of Calgary, 2011 - 2017
First Class Academic Scholarship, Northwest A&F University, 2010 - 2011
The National Scholarship, Ministry of Education of China, 2009 - 2010
Outstanding Student Leader Award, Northwest A&F University, 2008 - 2009

Work Experience

Postdoctoral Associate, Geomatics Engineering Department
University of Calgary, Calgary, Alberta, Canada **Oct. 2018 – Current**

- Implemented state-of-the-art visual SLAM algorithms including PTAM, LSD-SLAM, ORB-SLAM, and LDSO on MAVs
- Develop techniques coupling learning-based perception with path planning and control for micro aerial vehicle systems
- Develop pipelines for cars detection, tracking, and velocity estimation in dense traffic flow on MAVs

Research Experience

Ph.D. Researcher, Autonomous Reconfigurable/Robotic Systems Lab
University of Calgary, Calgary, Alberta, Canada **Sep. 2011 – Jan. 2017**

- Proposed algorithms for autonomous locomotion mode transition of Ground Hybrid Robots
- Developed simplified wheeled & legged multibody dynamics models for algorithm tests
- Built a hierarchical control system for a track-legged quadruped robot Cricket
- Created simulations of the Cricket robot using the V-REP for accurate analysis
- Interfaced the V-REP simulations with MATLAB and Python for data analysis and energy evaluations
- Designed and tested climbing gaits of steps negotiation with different heights for Ground Hybrid Robots

- Gained broad knowledge and experience with ground, aerial, and manipulator robots by communicating and cooperating with other lab member projects

Research Assistant, Mechanical and Electronic Engineering College
Northwest A&F University, Xi'an, Shaanxi, China **Oct. 2009 - May 2011**

- Participated one National Natural Science Foundation of China sponsored project and performed research on image denoising based on a hybrid wavelet transform method
- Designed, made and tested electrical circuit boards for a greenhouse monitoring and warning system project

Teaching Experience

Light Prototyping Technician, Schulich School of Engineering
University of Calgary, Calgary, Alberta, Canada **Oct. 2014 - Apr. 2016**

- Provided technical supports (e.g. 3D prints, Arduino, NI myDAQ) for undergraduate capstone design projects
- Managed and maintained lab equipment and inventory (e.g. 3D printers and base electronics)
- Created and revised standard operation procedure documents of lab equipment

Teaching Assistant, University of Calgary, Calgary, Alberta, Canada
ENGG 200 - Engineering Design and Communication **Sep. 2016 - Dec. 2016**

- Tutored 9 student groups on their introductory engineering design projects at all stages

ENME 461 - Foundations of Mechatronics **Sep. 2014 - Dec. 2014**

- Delivered weekly tutorial lectures and advised the assignments issues
- Supervised 6 mechatronics design project labs

ENME 339 - Engineering Graphics and CAD **Jan. 2014 - May 2014**

- Instructed the bi-weekly SolidWorks design labs
- Advised 32 students' design projects and guided their 3-D printings

ENME 339 - Computing Tools for Engineering Design **Sep. 2013 - Dec. 2013**

- Tutored 9 MATLAB programming and 4 LabVIEW project labs

ENME 538 - Mechanical Design Methodology and Application **Sep. 2011 - May 2013**

- Advised 10 student groups of their capstone design projects
- Communicated projects process with sponsors, professors and students
- Graded assignments, design logbooks, presentations, reports, peer assessments

Presentations

Jie Wang, "Locomotion Mode Transition Study of Ground Hybrid Robots", in 19th International Conference on Climbing and Walking Robots and Support Technologies for Mobile Machines, September 2016, London, UK.

Jie Wang, "Stair-climbing and Energy Consumption Evaluation of a Leg-tracked Quadruped Robot", in IEEE International Conference on Advanced Intelligent Mechatronics, July 2016, Banff, Alberta, Canada.

Jie Wang, "Locomotion Mode Control of a Leg-tracked Quadruped Robot", in 7th Annual Graduate Student Research Conference in Mechanical Engineering, April 2016, Calgary, Alberta, Canada.

Jie Wang, "Multi-body Dynamics Modeling Methods of Rolling and Walking Locomotion Modes of Ground Hybrid Robots", in 5th Annual Graduate Student Research Conference in Mechanical Engineering, April 2014, Calgary, Alberta, Canada.

Jie Wang, “Ground Multi-locomotion Robots for Search and Rescue Review”, in 4th Annual Graduate Student Research Conference in Mechanical Engineering, April 2013, Calgary, Alberta, Canada.

Publications

Jie Wang*, Alex Ramirez-Serrano, (2016) Locomotion Mode Transition Study of Ground Hybrid Robots. Advance in Cooperative Robotics, proceedings of the 19th International Conference on Climbing and Walking Robots and Support Technologies for Mobile Machines, London, UK.

Jie Wang*, Alex Ramirez-Serrano, (2016) Stair-climbing and Energy Consumption Evaluation of a Leg-tracked Quadruped Robot. Proceedings of the 2016 IEEE International Conference on Advanced Intelligent Mechatronics, Banff, Alberta, Canada.

Extracurricular Activity

Reviewer of the IEEE/RSJ International Conference on Intelligent Robots and Systems (March – April 2017 & 2018)

ANSYS Recognized Training Certificates of “Introduction to ANSYS Design Modeler” and “Introduction to ANSYS Mechanical” granted by ANSYS official experts after attending a four-day classroom training workshop and passing evaluation exams (May, 2014)

Vice President of the college student union of Northwest A&F University (2008 – 2009)