JIE WANG

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RESEARCH STATEMENT

I am excited about technologies that improve autonomy of robotic systems, especially a combination of model-based and learning-based methods to achieve a high-performance robot interaction with real-world, dynamic, unstructured environments safely and effectively. I have experience in control, machine learning, and perception. I am strongly motivated to conduct researches in real applications of mobile robotics.

Robot Learning: I am working on integrating learning modules appropriately into model-based robotic control architecture. Robotic Perception: I worked on perception solutions for micro aerial vehicles, including visual SLAM, CNN-based multi-object detection and tracking, and semantic segmentation by CNN combing traditional computer vision methods. Robotic Action: I worked on integration of learning-based vision modules with model-based path planning and control for autonomous navigation of micro aerial vehicles. I worked on multibody dynamics modeling, control, and simulation of a quadrupedal track-legged robot.

EMPLOYMENT

Post-Doctoral Fellow 2020–
Offroad Robotics, Ingenuity Labs Research Institute, Queen's University.

Post-Doctoral Fellow 2018–2019
Dept. of Geomatics Engineering, University of Calgary.
Dept. of Earth & Space Science & Engineering, York University.

Research Assistant 2011–2017
UVS Robotics Lab, Dept. of Mechanical & Manufacturing Engineering, University of Calgary.

EDUCATION

Ph.D. Mechanical Engineering (Robotics), University of Calgary, Canada. 2011–2017
UVS Robotics Lab, Dept. of Mechanical & Manufacturing Engineering.
Advisor: Prof. Dr. Alex Ramirez-Serrano.
Thesis title: "Autonomous Locomotion Mode Transition of Ground Hybrid Robots."

B.Sc. Mechanical and Electrical Engineering, Northwest A&F University, China. 2007–2011

AWARDS

Full Registration Fees Support of DLRL summer school 2019, CIFAR & Amii.	2019
Mitacs Career Connect Award, University of Calgary.	2018–2019
Faculty of Graduate Studies Travel Award, University of Calgary.	2016
Research Assistant Scholarship, University of Calgary.	2011–2015
First-Class Academic Scholarship, Northwest A&F University.	2010–2011
National Excellent Academic Scholarship, Ministry of Education of China.	2009–2010
Outstanding Student Leader Award, Northwest A&F University.	2008–2009

PUBLICATIONS

[J1] **Jie Wang**, Sandra Simeonova, and Mozhdeh Shahbazi, "Orientation- and Scale-Invariant Multi-Vehicle Detection and Tracking from Unmanned Aerial Videos," Remote Sensing, vol. 11, no. 18, pp. 2155, 2019. [pdf]

[C1] **Jie Wang** and Mozhdeh Shahbazi, "Mapping Quality Evaluation of Monocular SLAM Solutions for Micro Aerial Vehicles," International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences (ISPRS Archives), 2019. [pdf]

[C2] **Jie Wang** and Alex Ramirez-Serrano. "Stair-climbing and Energy Consumption Evaluation of a Leg-tracked Quadruped Robot," in Proc. of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), pp. 1448–1453, 2016. [pdf]

[C3] **Jie Wang** and Alex Ramirez-Serrano. "Locomotion Mode Transition Study of Ground Hybrid Robots," in Proc. Of the International Conference on Climbing and Walking Robots and Support Technologies for Mobile Machines (CLAWAR), pp. 531–538, 2016. [pdf]

[P1] **Jie Wang**, Alex Ramirez-Serrano, and Krispin Davies, "Autonomous Locomotion Mode Transition Simulation of a Track-legged Quadruped Robot Step Negotiation," arXiv:1905.04235, 2019. [pdf]

PROJECTS

Multiple Vehicle Detection and Tracking from Unmanned Aerial Videos. [link]	2019
AlphaPilot AI Drone Challenge Machine Vision Test. [link]	2019
Mapping Quality Evaluation of Monocular SLAM Solutions for UAVs. [link]	2019
Imitation Learning for a Self-driving Car in Unity Simulator. [link]	2018
Estimation: Particle Filter (GPS and IMU) [link]; EKF (LiDAR and Radar) [link]; UKF (LiDAR and Radar) [link].	2018
Control: PID [link]; MPC [link].	2018
Perception: Traffic Sign Classifier [link]; Lane Detection [link].	2017
Locomotion Selection and Motion Planning of Multi-Locomotion Hybrid Robots. [link]	2011–2017

TEACHING

Light Prototyping Technician

Schulich School of Engineering, University of Calgary. 2014–2016

Provided technical supports (e.g., 3D prints, Arduino, NI myDAQ) for undergraduate capstone projects.

Teaching Assistant

Dept. of Mechanical and Manufacturing Engineering, University of Calgary.

ENGG 200: Engineering Design and Communication.	2016
ENME 461: Foundations of Mechatronics.	2014
ENME 339: Engineering Graphics and CAD.	2014
ENME 337: Computing Tools for Engineering Design.	2013
ENME 538: Mechanical Design Methodology and Application.	2011–2013

MENTORING

Master's Students

Sandra Simeonova (Geomatics Engineering, University of Calgary)	2018–2019
Camilo Cortes (Geomatics Engineering, University of Calgary)	2018–2019
Eric Wang (Geomatics Engineering, University of Calgary)	2018–2019
Parnia Shokri (Electrical Engineering, University of Calgary)	2019
Michael Fader (Mechanical and Materials Engineering, Queen's University)	2020
Natassia Lunzmann (Electrical and Computer Engineering, Queen's University)	2020

Undergraduate Students

Kaela Johnson (Mechanical Engineering, University of Calgary)	2019
Liége Maldaner (Electrical Engineering, Federal University of Santa Maria)	2019
Andrew Farley (Computer Engineering, Queen's University)	2020

SERVICE

Reviewer of IEEE International Conference on Robotics and Intelligent Systems (IROS).	2017–2020
Reviewer of IEEE Transactions on Systems, Man and Cybernetics: Systems	2020

OUTREACH

Referee of Hacking and Designing Geomathon event, University of Calgary.	2019
Mentor of FIRST LEGO League of team Supernova, Calgary.	2019

PERSONAL INFORMATION

Residency: China citizen, Canada permanent resident.
Languages: Chinese (native), English (fluent).
Hobbies: Hiking, Cooking.