JIE WANG

University of Calgary
2500 University Drive NW
Calgary, Alberta T2N 1N4, Canada

email: wang4@ucalgary.ca
phone: (+1) 403-926-6909
web: www.jiewang.name

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RESEARCH STATEMENT

I am excited about any technology that improves the 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 robotic perception and control, and I am strongly motivated to conduct researches in robot learning.

Robot Learning: How to integrate learning modules into model-based robotic architecture appropriately? Robotic Perception: I am working 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 am trying to integrate the learning-based vision module with model-based path planning and control for autonomous navigation of micro aerial vehicles. I used to work on multibody dynamics modeling, control, and simulation of a quadrupedal track-legged robot.

EMPLOYMENT

Postdoctoral Associate 2018–
Dept. of Geomatics Engineering, University of Calgary.
Dept. of Earth & Space Science & Engineering, York University.

Research Assistant 2011–2017
Dept. of Mechanical and Manufacturing Engineering, University of Calgary.

EDUCATION

Ph.D. Robotics, University of Calgary, Canada. 2011–2017
Unmanned Vehicles Robotarium Lab, Dept. of Mechanical and 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

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**, Camilo Cortes, and Mozhdeh Shahbazi, "Evaluating the Mapping Quality of Monocular SLAM Solutions for Micro Aerial Vehicles," International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences (ISPRS Archives), vol. XXX-X, pp. XX-XX, 2019. [Accepted][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

Rail Track Segmentation and Defects Detection. [ongoing] 2019
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)
Camilo Cortes (Geomatics Engineering, University of Calgary)
Eric Wang (Geomatics Engineering, University of Calgary)
Parnia Shokri (Electrical Engineering, University of Calgary)

Undergraduate Students

Kaela Johnson (Mechanical Engineering, University of Calgary)
Liége Maldaner (Electrical, Federal University of Santa Maria)

SERVICE

Reviewer of IEEE International Conference on Robotics and Intelligent Systems (IROS).	2017–2019

OUTREACH

Referee of hacking and designing Geomathon event.	2019
Mentor of FIRST LEGO League of team Supernova.	2019

PERSONAL INFORMATION

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