NIU Xuezhi

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Education

- **Uppsala University** — 2024–2028(Est.)
  Ph.D. Student in Embedded Systems — Uppsala, Sweden
- **KTH Royal Institute of Technology** — 2021–2023
  M.Sc. Mechatronics — Stockholm, Sweden
- **City University of Hong Kong** — 2017–2021
  B.Eng. Mechanical Engineering — Hong Kong SAR, China
- **National University of Singapore** — 2020
  Academic Exchange — Singapore

Research Interests

- Cyber-Physical Systems
- Reinforcement Learning
- Control & Dynamics
- Heterogeneous Robots Collaboration

Journal Publications

- K. Tan, X. Niu, Q. Ji, L. Feng, and M. Törngren. "Optimal gait design for a soft quadruped robot via multi-fidelity Bayesian optimization," Applied Soft Computing, vol. 169, p. 112568, 2025.

Conference Publications

- J. Xu, X. Niu, D. G. Broo, K. Hjort. TouchDrive: Electronics-Free Tactile Sensing Interface for Assistive Grasping. Accepted for presentation at the workshop RoboTac: Embodied Tactile Intelligence in Predictive Perception, Learning, & Control in Grasp & Manipulation: Emerging the Role of Embodiment and Visuo-Tactile-LLM Foundation Models, with IEEE International Conference on Robotics and Automation 2026.
- A. Rouchitsas, X. Niu, G. Castellano and D. G. Broo. "What do I do now?": Spontaneous Human Responses to Robot Effectiveness and Efficiency Malfunctions in Collaborative Robotics. In The ACM Conference on Human Factors in Computing Systems (CHI2026). ACM, 2026.
- X. Niu and D. G. Broo. Investigating Symbiosis in Robotic Ecosystems: A Case Study for Multi-Robot Reinforcement Learning Reward Shaping. In 2025 9th International Conference on Robotics and Automation Sciences (ICRAS). IEEE, 2025.
- X. Niu, N. C. Barajas and D. G. Broo. Enabling Symbiosis in Multi-Robot Systems through Multi-Agent Reinforcement Learning. In 2025 IEEE 8th International Conference on Industrial Cyber-Physical Systems (ICPS). IEEE, 2025.
- X. Niu*, K. Tan*, D. G. Broo and L. Feng. Optimal Gait Control for a Tendon-driven Soft Quadruped Robot by Model-based Reinforcement Learning. In 2025 International Conference on Robotics and Automation (ICRA). IEEE, 2025.

Working Papers

- J. Xu, X. Niu, J. Andersson, D. G. Broo and K. Hjort. Miniaturized Multifunctional Valves for Intelligent Pneumatic Systems in Soft Robotics. Under submission to journal publications.
- X. Niu and D. G. Broo. MORPH: Self-Organising Multi-Robot Task Allocation via Neuroplasticity-Inspired Adaptive Topology. Under submission to conference.

Other Publications

- Maser Thesis: X. Niu (2023). Optimal Gait Control of Soft Quadruped Robot by Model-based Reinforcement Learning. Thesis, 2023. Available: DiVA, id: diva2:1810127.
- HK project: C. Egenäs*, F. Ekman*, C. Ma*, T. Naser*, X. Niu*, A. Sernelin*, S. Stenow*, and B. Ström*, "Electronically Vacuum Regulated Shut-off Valve for Milking System," Report (Refereed), 2023. [Online]. Available: DiVA, id: diva2:1738909.

Professional Service

- Reviewer for Journal of Field Robotics (JFR), IEEE International Conference on Robotics and Automation (ICRA), IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), IEEE-RAS International Conference on Humanoid Robots (Humanoids), IEEE International Conference on Industrial Cyber-Physical Systems (ICPS), IEEE International Conference on Robot and Human Interactive Communication (ROMAN).
- Teaching assistant for master level courses at KTH (MF2007) and Uppsala (1DT106, 1DT108, 1DT054, 1RT495, 1DT104, 1DT059)
- Master thesis supervision (Ibrahim Bala)

Awards & Achievements

- IEEE Robotics and Automation Society Travel Grant Awardee for ICRA, Atlanta, United States 2025.5
- Talent Development Scholarship, Hong Kong SAR, China 2020.6
- Second Prize in National Finals of the "Challenge Cup" Competition, Beijing, China 2019.11
- Silver Prize in National Finals of "Internet +" Competition, Hangzhou, China 2019.10
- Second Prize in HK University Student Innovation and Entrepreneurship Competition, Hong Kong SAR, China 2019.4

Skills

MATLAB/Simulink, Python, C/C++, R, ROS/ROS2, MoveIt, PyTorch, OpenCV, Gazebo, Isaac Sim, Gym/Gymnasium, URDF/SDF/Xacro, RRT*, PRM, A*, Dijkstra, PID, MPC, adaptive, H^{∞}, HJB, EKF, UKF, RL (PPO, SAC, DQN, DDPG), RGB-D/LiDAR perception, SLAM, Optical/Stereo cameras, IMU, Encoder, Strain Gauge, Force/Torque Sensor, Fluid/Air Pressure Sensor, motor (BLDC, PMSM, stepper, servo, H-bridge, FOC), STM32, ESP32, Jetson, Raspberry Pi, NXP LPC, Zephyr, FreeRTOS, Keil, UART, SPI, I^2C, TCP/IP, Modbus, DDS, MQTT, SolidWorks, Solid Edge, AutoCAD, Autodesk EAGLE, KLayout, COMSOL, LS-DYNA, 3D prototyping, CNC machining, lithography, CVD, PVD, etching (RIE/DRIE), doping, SEM/TEM, Inkscape, LaTeX.