

Changjin Wang

Recommend to visit my personal website for more detailed videos and explanation: <https://wangchangjin123.github.io/cv/>

Education:

Mechanical Electronic Engineering, **Beijing Institute of Technology** (Bachelor degree, 2013-2017)

Mechanical Engineering, **The University of Auckland** (Jointed-training student, 2017)

Bionic Robot Engineering, **Beijing Institute of Technology** (Master degree, 2017-2020)

Work:

Huawei Technologies Co., Ltd (Robot algorithm engineer, 2020.7 - now)

Publications:

1: An integrated two-pose calibration method for estimating head-eye parameters of a robotic bionic eye[J]. **IEEE Transactions on Instrumentation and Measurement**, 2019, 69(4): 1664-1672. Chen Xiaopeng, Wang Changjin, Zhang Weizhong, et al. (2nd Author, First Author is my tutor)

[paper](#)

2: The Design and Development of an Anthropomorphic Worm-Gear Driven Robotic Hand: BIT-JOCKO. 2019 IEEE 4th **International Conference on Advanced Robotics and Mechatronics (ICARM)**. Changjin Wang, Yao Sun, Jiafeng Xu. etc. Best Paper Finalist

[paper](#)

Projects:

Hybrid robot consisting of 18-DOF legged robot + robotic arm

The system integrates a 12-DOF wheel-legged robot with a 6-DOF robotic arm, employing Acados's nonlinear solver and an algorithmic framework similar to ETH. Friction cone constraints in the nonlinear MPC analyze wheel-foot contact forces, ensuring kinematic feasibility. The design, resembling an Ackerman vehicle, utilizes floating-based kinematics for 18-DOF full-body Jacobian non-space control, enabling whole-body grasping and obstacle traversal with balance

An unified implementation of Point-mass model for 4WIS robot

This work employs continuous optimization to unify four-wheel modes, optimizing energy consumption. Unlike traditional methods, it automatically decomposes commands into a point-mass model, enabling any-trajectory following within max velocity.

A low-cost, low-inertia, low-mass compliant force-controlled robotic arm

To address challenges in mobile robotics, a lightweight, low-inertia PIEPPER-configured robotic arm is designed, featuring self-developed FOC drivers for kinematics, dynamics, and trajectory planning. The 5kg arm, discarding Moveit architecture, achieves high precision and smoothness, making it cost-effective for mobile robots.

One biomimetic eye attitude stabilization algorithm based on gravity compensation

This project focuses on biomimetic eye robots and introduces a stabilization algorithm using gravity compensation and attitude disturbance observation. Achieving disturbance rejection of 5Hz and above, it maintains end-effector stability within 0.5°.

An online bionic eye external parameter calibration and computation algorithm

For biomimetic eye robots, a method is proposed for real-time computation of binocular external parameters during motion, enhancing accuracy in locating points and recovering depth information. This approach increases the field of view for moving cameras compared to fixed ones.

A biomimetic eye active exploration algorithm based on eye-foot coordination

Utilizing biomimetic eyes for Active SLAM, the algorithm integrates Octomap's projection maps and Gmapping's contour maps to identify visual reconstruction voids. Employing ray projection and Best View concepts, the robot achieves efficient 3D reconstruction and 2D map construction in unfamiliar environments with full autonomy

An adaptive dexterous hand

The dexterous hand employs a worm gear for power-off self-locking, theoretically supporting weight within structural strength limits. With a modular knuckle design and highly anthropomorphic features, it offers 20 degrees of freedom, enhancing palm grasping space by 30% through increased palm side swing freedom

Skills:

C++, Python, MATLAB, good at robotic arm lower-level kinematics, dynamics, floating base dynamics, trajectory planning, familiar with optimal control.

Honors:

Worked at Huawei for 3 years, received two annual A awards, top 15%, and one annual B+.

National Scholarship

National Motivational Scholarship

Tang Nanjun Scholarship

SMC Scholarship

First-class Academic Scholarship for Graduate Students

First Prize in the National College Student "Challenge Cup" Competition

First Prize in the National Aerospace Model Competition

Second Prize in the National College Student Energy Saving and Emission Reduction Competition

Top Ten Projects in the National College Student Innovation and Entrepreneurship Annual Meeting

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