

YUNHAI HAN

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EDUCATION BACKGROUND

University of California, San Diego (UCSD)

09/2019 - present

M.S. in Dynamics & Controls, Mechanical and Aerospace Engineering

GPA: 3.909/4.00

· **Relevant Courses:** Robotics

Yanshan University

09/2015 - 07/2019

B.S. in Mechatronics, Mechanical Engineering

GPA: 3.792/4.5, Ranking: 2nd of 594

· **Relevant Courses:** Mechatronics

FILED OF INTERESTS

Robotics Perception and Automation; Robotics Control; State Estimation;

RESEARCH PROJECTS

Auto-calibration Method for Urban Autonomous Driving Applications

- Present a system for dynamic camera calibration based on recognition of stop signs
- Camera intrinsic parameters are tracked over time and converges to stable values within a short time
- Experimental results show improved performance for the auto-calibration
- Submitted a paper to **IEEE RA-L with ICRA** as first-author

Surgical Simulation Framework for Tool-Tissue Interaction

- Propose the framework that continuously tracks the motion of manipulator and simulates the tissue deformation
- Compute the deformation energy for the control and planning task using implicit Euler energy
- Published a paper at **IROS Workshop (Cognitive Robotic Surgery)** as first author and gave a spotlight presentation

Real-to-Sim Registration of Deformable Soft Tissue with Position-Based Dynamics

- Propose an online, continuous, registration method to bridge from 3D visual perception to position-based dynamics modeling of tissues
- Account for differences between the simulation and the real, live surgical scenes.
- Submitted a paper to **ICRA** as second-author

Numerical verification of the differential privacy for a novel moving-horizon estimator

- Design a differential privacy test framework for distributional systems using numerical verification method
- Capable of being easily extended to other estimators for the verification of the claimed differential privacy

PUBLICATIONS

- Han. Y, Liu. Y, Paz. D, and Christensen. I. H, "Auto-calibration Method Using Stop Signs for Urban Autonomous Driving Applications", arXiv:2010.07441
- Han. Y, Liu. F and M. C. YIP, "A 2D Surgical Simulation Framework for Tool-Tissue Interaction", arXiv:2010.13936
- Liu. F, Li. Z, Han. Y, J Lu, F Richter and M. C. YIP, "Real-to-Sim Registration of Deformable Soft Tissue with Position-Based Dynamics for Surgical Robot Autonomy", arXiv:2011.00800

AWARDS & HONORS

AWARDS

- *06/2016* China Undergraduate Mathematical Contest in Modelling (CUMCM) *Second Prize*
- *03/2017* Zhou Peiyuan Mechanics Competition *National Excellence Award*
- *05/2017* National Electronic Design Competition *Successful Entry Certificate*
- *09/2017* Asia-Pacific Mathematical contest in modeling (APMCM) *Second Prize*
- *01/2018* Mathematical Contest in Modeling (MCM/ICM) *Honorable Mention*
- *08/2018* RM RoboMasters *Second Prize*

HONORS

- *11/2017* National Scholarship from Chinese Ministry of Education
- *07/2018* Certificate for Attendance of CDIO 2018 Academy (Japan)
- *06/2019* Certificate of Excellent Graduate in Hebei Province

COMPUTER SKILLS

Programming Language	C/C++, Python, MATLAB/Simulink, LaTeX
Embedded Development	STM32