

Chuchu Chen

Education & Training

- 2020-Present **PhD Mechanical Engineering**, *University of Delaware, Newark, DE.*
Advisor: Dr. Guoquan(Paul) Huang, Dr. Bert Tanner
- 2021-Present **MS Computer & Information Science**, *University of Delaware, Newark, DE.*
Advisor: Dr. Guoquan(Paul) Huang
- 2017 **MS Mechanical Engineering**, *University of Delaware, Newark, DE.*
Advisor: Dr. Bert Tanner
- 2013 **BS Mechanical Engineering**, *Harbin Engineering University, Harbin, China.*

Professional Experience

- 2020-Present **Research Assistant** *University of Delaware*
[1] Consistent Visual-inertial Navigation systems (VINS)
[2] Aided inertial navigation with geometric constraints
[3] Nonlinear state estimation and optimization theory
[4] Dynamic system parameter calibration and identification
[5] Navigation function for point robot in dynamic environment
- 2019-2020 **Teaching Assistant** *University of Delaware*
2019F MEEG 311: Vibration and Control
2020S/2023S MEEG 677: Estimation I

Publications

Journal Articles

- [J3] W. Lee, P. Geneva, **C. Chen**, G. Huang " MINS: Efficient and Robust Multisensor-aided Inertial Navigation System ", arXiv, 2023.
- [J2] C. Wei*, **C. Chen***, H. G. Bert" Navigation Functions with non-Point Destinations and Moving Obstacles ", Autonomous Robots, 2023 (*equally contributed)
- [J1] Y. Yang, **C. Chen**, W. Lee, G. Huang" Decoupled Right Invariant Error States for Consistent Visual-Inertial Navigation", IEEE Robotics and Automation Letters (R-AL), 2022.

Conference Papers

- [C13] **C. Chen**, Y. Peng, and G. Huang" Fast and Consistent Covariance Recovery for Sliding-window Optimization-based VINS", International Conference on Robotics and Automation (ICRA), 2024 [submitted].
- [C12] Y. Peng, **C. Chen**, and G. Huang" Ultrafast Square-Root Filter-based VINS", International Conference on Robotics and Automation (ICRA), 2024 [submitted].
- [C11] Y. Peng, **C. Chen**, and G. Huang" Quantized Visual-Inertial Odometry", International Conference on Robotics and Automation (ICRA), 2024 [submitted].

- [C10] W. Lee, **C. Chen**, and G. Huang" Degenerate Motions of Multisensor Fusion-based Navigation", International Conference on Robotics and Automation (ICRA), 2024 [submitted].
- [C9] S. Katragadda, W. Lee, Y. Peng, p. Geneva, **C. Chen**, C. Guo, M. Li and G. Huang" NeRF-VINS: A Real-time Neural Radiance Field Map-based Visual-Inertial Navigation System", arXiv, 2023.
- [C8] **C. Chen**, P. Geneva, Y. Peng, W. Lee and G. Huang" Optimization-based VINS: Consistency, Marginalization, and FEJ", International Conference on Intelligent Robots and Systems (IROS), 2023.
- [C7] N. Merrill, P. Geneva, S. Katragadda, **C. Chen**, and G. Huang" Fast Monocular Visual-Inertial Initialization Leveraging Learned Single-View Depth", Proc. of Robotics: Science and Systems (RSS), 2023 [[Best Student Paper Award Finalist](#)].
- [C6] **C. Chen***, P. Geneva*, Y. Peng, W. Lee and G. Huang" Monocular Visual-Inertial Odometry with Planar Regularities", International Conference on Robotics and Automation (ICRA), 2023.
- [C5] **C. Chen**, Y. Yang, P. Geneva, W. Lee and G. Huang" Visual-Inertial-Aided Online MAV System Identification", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.
- [C4] **C. Chen**, Y. Yang, P. Geneva and G. Huang" FEJ2: A Consistent Visual-Inertial State Estimator Design", International Conference on Robotics and Automation (ICRA), 2022.
- [C3] **C. Chen**, L. Li and H. G. Bert " Navigation Functions with non-Point Destinations and Moving Obstacles", American Control Conference (ACC), 2020.
- [C2] P. Geneva*, N. Merrill*, Y. Yang, **C. Chen**, W. Lee, and G. Huang" Versatile 3D Multi-Sensor Fusion for Lightweight 2D Localization", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020.
- [C1] Y. Yang, B. P. W. Babu, **C. Chen**, G. Huang, and L. Ren" Analytic Combined IMU Integration (ACI^2) for Visual-Inertial Navigation", International Conference on Robotics and Automation (ICRA), 2020.

[Open Source](#)

- [O3] **MINS**: Efficient and Robust Multisensor-aided Inertial Navigation System [arXiv] <https://github.com/rpng/MINS>
- [O2] **ov_plane**: Monocular Visual-Inertial Odometry with Planar Regularities [ICRA23] https://github.com/rpng/ov_plane
- [O1] **RPNG AR Table Dataset**: Indoor AR Table Visual-Inertial Datasets [ICRA23] https://github.com/rpng/ar_table_dataset

[Technical Report](#)

- [T9] **C. Chen**, Y. Peng, and G. Huang" Technical Report: Fast and Consistent Covariance Recovery for Sliding-window Optimization-based VINS" [to appear]
- [T8] Y. Peng, **C. Chen**, and G. Huang" Ultrafast Square-Root Filter-based VINS" [to appear]
- [T7] W. Lee, **C. Chen**, and G. Huang" Technical Report: Degenerate Motions of Multisensor Fusion-based Navigation [to appear]"
- [T6] N. Merrill, P. Geneva, S. Katragadda, **C. Chen**, and G. Huang" Supplementary Materials: Fast Monocular Visual-Inertial Initialization Leveraging Learned Single-View Depth" URL: https://chuchuchen.net/downloads/reports/tr_init_depth.pdf

- [T5] **C. Chen**, Y. Yang, W. Lee ,P. Geneva and G. Huang " Supplementary Materials: Visual-Inertial-aided Online MAV System Identification URL: https://chuchuchen.net/downloads/reports/tr_mav_final.pdf
- [T4] **C. Chen**, Y. Yang, P. Geneva and G. Huang " Technical Report: FEJ2: A Consistent Visual-Inertial State Estimator Design URL: https://chuchuchen.net/downloads/reports/tr_fej2.pdf
- [T3] Y. Yang, **C. Chen**, W. Lee and G. Huang " Supplementary Materials: Decoupled Right Invariant Error States for Consistent Visual-Inertial Navigation https://chuchuchen.net/downloads/reports/tr_dri.pdf
- [T2] Y. Yang, **C. Chen**, and G. Huang " Supplementary Materials: Analytic Combined IMU Integration (ACI²) for Visual-Inertial Navigation" URL: https://chuchuchen.net/downloads/reports/tr_aci.pdf
- [T1] W. Lee, K. Eckenhoff, Y. Yang, P. Geneva and **C. Chen** and G. Huang " Visual-Inertial-Wheel Odometry with Online Calibration https://udel.edu/~ghuang/papers/tr_wheel-vio.pdf

Academic Service

Journal Reviewer

TR-O IEEE Transactions on Robotics

RA-L IEEE Robotics and Automation Letters

Conference Reviewer

ICRA IEEE International Conference on Robotics and Automation

IROS IEEE/RSJ InternationalConference on Intelligent Robots and Systems

RSS Robotics: Science and Systems

MED Mediterranean Conference on Control and Automation

Professional Membership

IEEE

IEEE Robotics and Automation Society

IEEE Control Systems Society