

SHENGLUN YI

Research Scholar - Control Science and Engineering



EDUCATION

Ph. D. - Control Science and Engineering
Beijing Institute of Technology - Beijing, China

2018.9 - 2022.7

Supervisor: Prof. Xuemei Ren
Thesis Title: Robust Estimation for Uncertain System.

M. Eng. - Control Engineering
Beijing Technology and Business University - Beijing, China
(Top 0.2% among all postgraduates)

2016.9 - 2018.7

Supervisor: Prof. Xuebo Jin
Thesis Title: State Estimation under Complex Uncertain Noise.

B. Eng. - Automation
Chongqing University - Chongqing, China

2012.9 - 2016.7

Thesis Title: Audio Signal Processing based on the Wavelet Transform.

EXPERIENCE

Researcher (Type B)
Department of Information Engineering, University of Padova- Padova, Italy

2022.12 - 2024.12

Collaborations: Prof. Mattia Zorzi and Prof. Zhengjie Wang
Topic: Robust Navigation for Unmanned Aerial Vehicles.

Postdoc (Through "incarico di prestazione di lavoro autonomo")
Department of Information Engineering, University of Padova- Padova, Italy

2022.6 - 2022.12

Supervisor: Prof. Mattia Zorzi
Topic: Robust Filtering for Nonlinear Systems under Model Uncertainty.

Visiting scholar
Department of Information Engineering, University of Padova- Padova, Italy

2019.9 - 2021.6

Supervisor: Prof. Mattia Zorzi
Topic: Robust Estimation under Model Uncertainty.

CONTACTS

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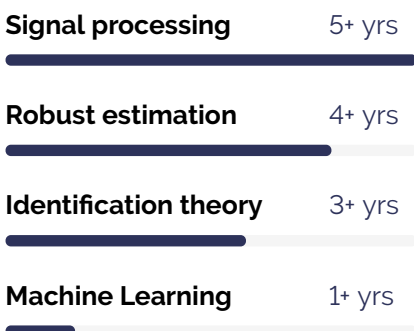
PROJECTS

Research on the UAV Co-location and Mapping.
Financial support: Beijing Institute of Technology

2021.9 - ongoing

Position estimation for UAV based on distributed Kalman filter and deep learning.

RESEARCH TOPICS



Reconstruction of Indoor Pedestrian Trajectory based on Intelligent Mobile Terminal. 2021.3 - 2021.9
Financial support: National Natural Science Foundation of Beijing, China

Position estimation for indoor and outdoor location-based services (LBSs) based on machine learning.

Robust Estimation for Uncertain System. 2019.9 - 2021.3
Financial support: China Scholarship Council (CSC)

Robust estimation for uncertain system based on robust Kalman filter.

Research on Test Method and Realization of Dynamic Substructure for Vibration Isolation Structure. 2019.3 - 2019.9
Financial support: National Natural Science Foundation of China (NSFC) (No. 51978016)

Parameter estimation for nonlinear system based on robust EKF.

Research on Experimental Technology of High-performance Shaking Table Substructure based on Real-time Simulation Compensation. 2018.3 - 2019.3
Financial support: NSFC (No. 51608016)

System identification for Bouc-Wen model based on constraint UKF.

Seismic Performance Analysis of Civil Structure. 2017.9 - 2018.3
Financial support: Postgraduate Research Capability Improvement Program (Project Investigator)

Online denoising for vibration signal based on data-driven-based robust Kalman filter.

Speed Measurement and Ranging of High-speed Trains. 2017.3 - 2017.9
Financial support: Beijing Railway Research Institute

Velocity and displacement estimation for high-speed trains based on the adaptive Kalman filter.

Identification and Evolution Analysis of High Dimensional Motion Features Based on Space-time Large Data Group Objects. 2016.9 - 2018.6
Financial support: NSFC (No. 61673002)

Trajectory tracking for high maneuvering target based on the adaptive statistics models.

JOURNAL ARTICLES

S. Yi and M. Zorzi, 'Robust Kalman Filtering under Model Uncertainty: the Case of Degenerate Densities.' *IEEE Transactions on Automatic Control*, vol. 67, no. 7, pp. 3458-3471, 2022. (full paper)

S. Yi and M. Zorzi, 'Robust Fixed-lag Smoothing under Model Perturbations.' *Journal of the Franklin Institute*, 2022. (Accepted)

T. Su, S. Yi, X. Jin and J. Kong, 'An Improved Online Denoising Algorithm based on the Adaptive Noise Covariance.' *Innovative Techniques and Applications of Modelling, Identification and Control. Lecture Notes in Electrical Engineering*, vol. 467, pp. 119-132, 2018.

S. Yi, X. Jin, T. Su, Z. Tang, F. Wang, N. Xiang and J. Kong, 'Online Denoising based on the Second-order Adaptive Statistics Model.' *Sensors*, vol. 17, no. 7: 1668, 2017.

S. Yi, X. Ren, T. Su and D. Zheng, 'Online Denoising Using Data-driven-based Robust Kalman Filter in Structural Health Monitoring of RC Frame.' *International Journal of Adaptive Control and Signal Processing*, 2022.
under review

CONFERENCE ARTICLES

A. Longhini, M. Perbellini, S. Gottardi, S. Yi, H. Liu and M. Zorzi, 'Learning the Tuned Liquid Damper Dynamics by Means of a Robust EKF.' *American Control Conference*, IEEE, pp. 60-65, 2021.

S. Yi and M. Zorzi, 'Low-Rank Kalman Filtering under Model Uncertainty' *IEEE Conference on Decision and Control*, pp. 2930-2935, 2020.

S. Yi and X. Ren, 'Robust Online Filter based on a Second-Order Adaptive Model.' *Chinese Intelligent Systems Conference*, Springer, Singapore, pp. 691-698, 2020.

S. Yi, X. Ren and T. Su, 'An Improved Kalman Filter based on Self-adaptive Adjustment Parameters.' *Data Driven Control and Learning Systems Conference*, IEEE, pp. 1060-1064, 2019.

S. Yi, T. Su and X. Jin, 'Improved Smartphone-based Indoor Localization via Drift Estimation for Accelerometer.' *International Conference on Unmanned Systems*, IEEE, pp. 379-383, 2017.

S. Yi, X. Jin, T. Su and Q. Cai, 'A Fourth-order Current Adaptive Model for Online Denoising by Kalman Filter.' *Chinese Intelligent Systems Conference*, Springer, Singapore, 2017.

S. Yi, X. Jin and T. Su, 'An Improved Online Denoising Algorithm based on Kalman Filter and Adaptive Current Statistics Model.' *International Conference on Modelling, Identification and Control*, IEEE, pp. 135-145, 2017.

N. Xiang, F. Wang, B. Wang, S. Yi, X. Jin, T. Su, J. Kong, T. Bai, 'Gesture Detected by Inertial Sensor.' *Chinese Control and Decision Conference*, IEEE, pp. 7740-7743, 2017.

REVIEWER ACTIVITIES

Mr. Yi serves as reviewer for the following journal and conferences:

European Control Conference

Automatica

Journal of the Franklin Institute

American Control Conference

SKILLS

Matlab 5+ yrs

Python 1+ yrs

C 1+ yrs

AWARDS

Chinese National Scholarship

Top 0.2% among all postgraduates
Award: 20000RMB

CSC Scholarship

Award: 150000RMB

Beijing Outstanding Graduates

Top 5% among all postgraduates in Beijing

Outstanding Achievement Award (Postgraduate)

Top 10% among all postgraduates in BTBU
Award: 5000RMB

First Prize in Postgraduate Scholarships

Top 20% among all postgraduates in BTBU
Award: 8000RMB

First Prize in Postgraduate Excellent Paper

Top 3/101
Award: 10000RMB

Technology Talent of the Year

Top 10/101
Award: 3000RMB

IEEE Conference on Decision and Control

International Joint Conference on Artificial Intelligence

IEEE Transactions on Industrial Electronics

Chinese Control and Decision Conference

CONFERENCE PRESENTATIONS

American Control Conference (Online)

"Learning the tuned liquid damper dynamics"

2021. 05. 25

IEEE Conference on Decision and Control (Online)

"Low-Rank robust Kalman filtering"

2020. 12. 16

International Conference on Unmanned Systems (Beijing, China)

"Smartphone-based indoor localization"

2017. 10. 28

The Chinese Intelligent Systems Conference (Mudanjiang, China)

"Fourth-order current adaptive model for denoising"

2017. 10. 14

International Conference on Modelling, Identification and Control (Kunming, China)

"An improved online denoising algorithm based on Kalman Filter"

2017. 07. 11

COLLABORATIONS

Prof. Zhengjie Wang

Laboratory of Electromechanical Control and Unmanned Systems, School of Mechatronical Engineering, Beijing Institute of Technology, China

Topic: Multi-UAV Collaborative Navigation.

Prof. Zhenyun Tang

The Key Laboratory of Urban Security and Disaster Engineering, Ministry of Education, Beijing University of Technology, China

Topic: Seismic Design by Tuned Liquid Damper.

Prof. Tingli Su

Beijing Key Laboratory of Big Data Technology for Food Safety, School of Artificial Intelligence, Beijing Technology and Business University, China

Topic: State Estimation for Complex Systems based on Big Data.