Mingzhou Yin

Doctor of Sciences (Dr. sc. ETH Zürich)

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Brief biography

Mingzhou Yin has been a postdoctoral researcher in the Institute of Automatic Control at Leibniz University Hannover since August 2024. He received his Doctor of Sciences degree in 2024, supervised by Prof. Roy S. Smith in the Automatic Control Laboratory at ETH Zurich. His doctoral thesis is on regularized and nonparametric approaches in system identification and data-driven control. He received his MSc degree *cum laude* in control & simulation at the Faculty of Aerospace Engineering, Delft University of Technology, the Netherlands in 2018. His master's thesis research is on envelope-protected non-linear control of over-actuated aircraft in collaboration with Lockheed Martin. He received the joint bachelor's degree in Mechanical Engineering from Shanghai Jiao Tong University, China, and the University of Hong Kong, China, with first-class honours in 2016. He was the recipient of the IEEE Control Systems Society Swiss Chapter Young Author Best Journal Paper Award and the Systems Identification and Adaptive Control Technical Committee Outstanding Student Paper Prize in 2023.

Research interests

His research interests include data-driven modeling, simulation & control, Gaussian process-based control, sparse learning theory, system identification with subspace and regularized methods, model predictive control, and periodic system theory.

Employment

2024.08 - present Postdoctoral Researcher, Institute of Automatic Control, Leibniz University Hanover, Germany

2019.02 - 2024.02 Scientific Assistant, Automatic Control Laboratory, ETH Zurich, Switzerland

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Projects

2024.08 - 2025.12 Program zukunft.niedersachsen, Lower Saxony Ministry for Science and Culture, Germany

2020.08 - 2024.02 NCCR Automation, Swiss National Science Foundation, Switzerland

2019.02 - 2023.01 Modeling, Identification and Control of Periodic Systems in Energy Applications, Swiss National Science Foundation, Switzerland

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Education

2019.02 - 2024.02 Doctor of Sciences, Automatic Control Laboratory, ETH Zurich, Switzerland

Advisor: Roy S. Smith

Thesis: Regularized and nonparametric approaches in system identification and data-driven control

2016.09 – 2018.07 Master of Science in Aerospace Engineering [*Cum Laude*], Delft University of Technology, the Netherlands

Advisors: Coen de Visser, Qiping Chu

Thesis: Envelope estimation and protection of innovative control effectors (ICE) aircraft

2012.09 - 2016.06 Bachelor of Engineering in Mechanical Engineering [First Class Honours], Shanghai Jiao Tong University, China & the University of Hong Kong, China

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Awards

2023 IEEE Control Systems Society Swiss Chapter Young Author Best Journal Paper Award

2023 IEEE Control Systems Society Systems Identification and Adaptive Control Technical Committee Outstanding Student Paper Prize

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Publications (Google Scholar)

Preprints

[P1] **Yin M.**, Müller M.A. (2025). Gaussian Process-Based Prediction and Control of Hammerstein-Wiener Systems. arXiv:2501.15849.

[P2] **Yin M.**, Iannelli A., Nazari S.A., Müller M.A. (2025). A Unified Bayesian Framework for Stochastic Data-Driven Smoothing, Prediction, and Control. arXiv:2512.01475.

Journals

[J1] **Yin M.**, Müller M.A. (2025). Low-Rank Matrix Regression via Least-Angle Regression. *IEEE Control Systems Letters*, 9, 637-642.

[J2] Chen R., Srivastava A., **Yin M.**, Smith R.S. (2024). Closed-Loop Identification of Stabilized Models Using Dual Input-Output Parameterization. *European Journal of Control*, 101089.

[J3] **Yin M.**, Cai H., Gattiglio A., Khayatian F., Smith R.S, Heer P. (2024). Data-driven Predictive Control for Demand Side Management: Theoretical and Experimental Results. *Applied Energy*, 353(A), 122101.

[J4] **Yin M.**, Smith R.S. (2023). Error Bounds for Kernel-Based Linear System Identification with Unknown Hyperparameters. *IEEE Control Systems Letters*, 7, 2491-2496.

[J5] **Yin M.**, Iannelli A., Smith R.S. (2021). Maximum Likelihood Estimation in Data-Driven Modeling and Control. *IEEE Transactions on Automatic Control*, 68(1), 317-328.

[J6] **Yin M.**, Iannelli A., Smith R.S. (2021). Subspace Identification of Linear Time-Periodic Systems with Periodic Inputs. *IEEE Control Systems Letters*, 5(1), 145-150.

[J7] **Yin M.**, Chu Q. P., Zhang Y., Niestroy M. A., de Visser C. C. (2019). Probabilistic Flight Envelope Estimation with Application to Unstable Overactuated Aircraft. *Journal of Guidance, Control, and Dynamics*, 42(12), 2650-2663.

Conference Papers

[C1] Smith R.S, Abdalmoaty M., **Yin M.**. (2024). Optimal Data-Driven Prediction and Predictive Control using Signal Matrix Models. *IEEE Conference on Decision and Control*.

[C2] Smith R.S, Abdalmoaty M., **Yin M.**. (2024). Data-Driven Formulation of the Kalman Filter and its Application to Predictive Control. *IEEE Conference on Decision and Control*.

[C3] **Yin M.**, Iannelli A., Smith R.S. (2024). Stochastic Data-Driven Predictive Control: Regularization, Estimation, and Constraint Tightening. *IFAC Symposium on System Identification*.

[C4] Abdalmoaty M., Miller J., **Yin M.**, Smith R.S. (2024). Frequency-Domain Identification of Discrete-Time Systems using Sum-of-Rational Optimization. *IFAC Symposium on System Identification*.

[C5] Srivastava A., **Yin M.**, Iannelli A., Smith R.S. (2023). A Dual System-Level Parameterization for Identification from Closed-Loop Data. *IEEE Conference on Decision and Control*.

[C6] **Yin M.**, Akan M.T., Iannelli A., Smith R.S. (2022). Infinite-Dimensional Sparse Learning in Linear System Identification. *IEEE Conference on Decision and Control*.

[C7] Ozan D.E., **Yin M.**, Iannelli A., Smith R.S. (2022). Kernel-Based Identification of Local Limit Cycle Dynamics with Linear Periodically Parameter-Varying Models. *IEEE Conference on Decision and Control*.

[C8] **Yin M.**, Iannelli A., Smith R.S. (2022). Data-Driven Prediction with Stochastic Data: Confidence Regions and Minimum Mean-Squared Error Estimates. *European Control Conference*.

[C9] Iannelli A., **Yin M.**, Smith R.S. (2021). Design of Input for Data-Driven Simulation with Hankel and Page Matrices. *IEEE Conference on Decision and Control*.

[C10] Ozan, D.E., Iannelli A., **Yin M.**, Smith R.S. (2021). Regularized Classification and Simulation of Bifurcation Regimes in Nonlinear Systems. *The 3rd IFAC Conference on Modelling, Identification and Control of Nonlinear Systems*.

[C11] Iannelli A., **Yin M.**, Smith R.S. (2021). Experiment Design for Impulse Response Identification with Signal Matrix Models. *The 19th IFAC Symposium on System Identification*.

[C12] **Yin M.**, Smith R.S. (2021). On Low-Rank Hankel Matrix Denoising. *The 19th IFAC Symposium on System Identification*.

[C13] **Yin M.**, Iannelli A., Smith R.S. (2021). Maximum Likelihood Signal Matrix Model for Data-Driven Predictive Control. *Proceedings of the 3rd Conference on Learning for Dynamics and Control*, PMLR 144:1004-1014.

[C14] **Yin M.**, Iannelli A., Khosravi M., Parsi A., Smith R.S. (2020). Linear Time-Periodic System Identification with Grouped Atomic Norm Regularization. *IFAC World Congress*.

[C15] Khosravi M.*, **Yin M.***, Iannelli A., Parsi A., Smith R.S. (2020). Low-Complexity Identification by Sparse Hyperparameter Estimation. *IFAC World Congress*.

[C16] Khosravi M., Iannelli A., **Yin M.**, Parsi A., Smith R.S. (2020). Regularized System Identification: A Hierarchical Bayesian Approach. *IFAC World Congress*.

[C17] Parsi A., Iannelli A., **Yin M.**, Khosravi M., Smith R.S. (2020). Robust Adaptive Model Predictive Control with Worst-Case Cost. *IFAC World Congress*.

[C18] **Yin M.**, Chen Y., Lee K. H., Fu D. K., Tse Z. T. H., Kwok K. W. (2018). Dynamic Modeling and Characterization of the Core-XY Cartesian Motion System. *IEEE International Conference on Real-time Computing and Robotics*.

Theses

[T1] **Yin M.** (2024). Regularized and Nonparametric Approaches in System Identification and Data-Driven Control. ETH Zurich.

[T2] **Yin M.** (2018). Envelope Estimation and Protection of Innovative Control Effectors (ICE) Aircraft: A Probabilistic Approach. Delft University of Technology.