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About me

I am Naoki Chihara, a first-year Ph.D. student at The University of Osaka, Japan, and a specially appointed researcher at SANKEN (The Institute of Scientific and Industrial Research at The University of Osaka). My research mainly focuses on data stream mining [C1, C2] and causal discovery in time series [C1]. I am fortunate to be advised by [Prof. Yasushi Sakurai](#) and [Prof. Yasuko Matsubara](#) at SANKEN. I received my B.Sc. and M.Sc. degrees from The University of Osaka advised by [Prof. Makoto Onizuka](#) and [Prof. Yasushi Sakurai](#) in March 2023 and 2025, respectively.

Keywords: [Time series analysis](#), [Data mining](#), [Stream processing](#), [Causality](#), Koopman operator theory, Missingness mechanisms, Time series forecasting, [Bayesian optimization](#)

Links: [Linkedin](#) | [Google Scholar](#) | [GitHub](#) | [ORCID](#) | [Twitter](#) | [DBLP](#)

Education

Ph.D. in Information Science , The University of Osaka	2025–present
Department of Information Systems Engineering, Graduate School of Information Science and Technology	Osaka, Japan
• Expected graduation date is March 2028	
• Supervisor: Prof. Yasushi Sakurai	
M.Sc. in Information Science , The University of Osaka	2023–2025
Department of Information Systems Engineering, Graduate School of Information Science and Technology	Osaka, Japan
• Thesis: Stream Mining Time-evolving Causality for Time Series Forecasting	
• Supervisor: Prof. Yasushi Sakurai	
B.Sc. in Engineering , The University of Osaka	2019–2023
Department of Electronic and Information Engineering, School of Engineering	Osaka, Japan
• Thesis: Detection of Variable Celestial Objects using Machine Learning-based Periodic Analysis and Domain Knowledge	
• Supervisor: Prof. Makoto Onizuka	

Experience

Japan Society for the Promotion of Science (JSPS)	2025–present
Research Fellow DC1	Osaka, Japan
SANKEN, The University of Osaka	2023–present
Specially Appointed Researcher	Osaka, Japan
School of Engineering, The University of Osaka	2023
Teaching Assistant for “Exercises in Mathematical Analysis”	Osaka, Japan
Graduate School of Information Science and Technology, The University of Osaka	2021–2023
Assistant in the detection of variable celestial objects	Osaka, Japan
Nagase Co., Ltd.	2020–2023
Digital Technology Engineer	Tokyo, Japan

Awards

Award of the Graduate School of Information Science and Technology of Osaka University	Mar 2025
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DEIM2025 Student Presentation Award	Mar 2025
Information Processing Society of Japan (IPSJ) Yamashita SIG Research Award	Jul 2024
DEIM2024 Best Paper Award Runner-up (top 1.4%)	Jun 2024

Publications

Peer-reviewed Publications

- [C2] Naoki Chihara, Ren Fujiwara, Yasuko Matsubara, and Yasushi Sakurai. **CANMI: Causal Discovery under Nonstationary Missingness Mechanisms.** (Under submission to NeurIPS).
- [C1] Naoki Chihara, Yasuko Matsubara, Ren Fujiwara, and Yasushi Sakurai. **Modeling Time-evolving Causality over Data Streams.** Proceedings of the 31st ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '25), Toronto, ON, Canada, August 3-7, 2025. Acceptance rate: 19%. DOI: [10.1145/3690624.3709283](https://doi.org/10.1145/3690624.3709283).   |  [Q1hS6R1a8jg](https://www.youtube.com/watch?v=Q1hS6R1a8jg)
- [W1] Naoki Chihara, Yasuko Matsubara, Ren Fujiwara, and Yasushi Sakurai. **Stream Mining Time-evolving Causality in Time Series.** The 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '24) PhD Consortium, Barcelona, Spain, August 25-29, 2024. DOI: kdd2024.kdd.org/ph-d-consortium.
- [J2] Naoki Chihara, Yasuko Matsubara, Ren Fujiwara, and Yasushi Sakurai. **Real-time Forecasting of Time-evolving Data Streams using Dynamic Mode Decomposition.** IPSJ Transactions on Databases (TOD), Vol. 17, No. 2, pp. 1-11, April 23, 2024. DOI: ipsj.ixsq.nii.ac.jp/records/233825. URL: ipsj.ixsq.nii.ac.jp/records/233825.
- [J1] Naoki Chihara, Tadafumi Takata, Yasuhiro Fujiwara, Koki Noda, Keisuke Toyoda, Kaito Higuchi, and Makoto Onizuka. **Effective detection of variable celestial objects using machine learning-based periodic analysis.** Astronomy and Computing, Vol. 45, pp. 100765, November 3, 2023. DOI: [10.1016/j.ascom.2023.100765](https://doi.org/10.1016/j.ascom.2023.100765).

Non-refereed Publications

- [N4] Naoki Chihara, Yasuko Matsubara, Ren Fujiwara, and Yasushi Sakurai. **時間変化する因果関係の抽出に基づいた高速将来予測.** The 17th Forum on Data Engineering and Information Management (DEIM2025), Fukuoka, Japan, February 27 - March 4, 2025.
Student Presentation Award.
- [N3] Naoki Chihara, Yasuko Matsubara, Ren Fujiwara, and Yasushi Sakurai. **動的モード分解を活用した高速将来予測アルゴリズム.** The 16th Forum on Data Engineering and Information Management (DEIM2024), Hyogo, Japan, February 28 - March 5, 2024.
Best Paper Award Runner-up, IPSJ Yamashita SIG Research Award.
- [N2] Aiyi Li, Kenya Hoshimure, Kei Tanigaki, Yota Hatano, Reina Nozawa, Yuki Sakamoto, Yuanzhou Wei, Naoki Chihara, and Naoki Kodani. **Semi-autonomous Leader-follower Approach for Swarm Drone Guidance.** The 36th SICE Symposium on Decentralized Autonomous Systems, Tokyo, Japan, February 16-17, 2024.
- [N1] Naoki Chihara, Tadafumi Takata, Yasuhiro Fujiwara, and Makoto Onizuka. **周期解析による変動天体の検出.** The 15th Forum on Data Engineering and Information Management (DEIM2023), Gifu, Japan, March 5-9, 2023.

Patents

- [P1] Yasuhiro Fujiwara, Makoto Onizuka, and Naoki Chihara. **検出装置、検出方法及びプログラム.** 特開 2025-000129, January 7, 2025. DOI: jglobal.jst.go.jp/detail?JGLOBAL_ID=202503009056531197.

Academic Services

External Reviewers

- ACM WWW 2025
- ACM SIGKDD 2025

Conference Volunteer Work

- PAKDD 2023