Naoki Chihara

Curriculum Vitæ Summary

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University	www.osaka-u.ac.jp
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Last Updated Date	July 2, 2025

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

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.
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[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. URL: 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. 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.

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. URL: jglobal.jst.go.jp/detail?JGLOBAL_ID=202503009056531197.

Academic Services

External Reviewers

- ACM WWW 2025
- ACM SIGKDD 2025

Conference Volunteer Work

- PAKDD 2023