

# Tomohiko Nakamura

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🐙 <https://github.com/TomohikoNakamura>

## Research Interests

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Signal-processing-inspired deep learning, audio and music signal processing, and machine learning

## Job

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| <b>Senior Researcher</b><br><i>The National Institute of Advanced Industrial Science and Technology (AIST), Japan.</i>             | <b>Apr. 2023–Present</b>    |
| <b>Project Research Associate</b><br><i>Graduate School of Information Science and Technology, The University of Tokyo, Japan.</i> | <b>Sept. 2019–Mar. 2023</b> |
| <b>Researcher</b><br><i>Intelligent Systems Laboratory, SECOM, Japan.</i>  | <b>Apr. 2016–Aug. 2019</b>  |
| <b>Research Fellow (DC2)</b><br><i>Japan Society for the Promotion of Science (JSPS), Japan.</i>                                   | <b>Apr. 2015–Mar. 2016</b>  |

## Education

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| <b>Ph.D. degree in Information Science and Technology</b><br><i>Graduate School of Information Science and Technology, The University of Tokyo, Japan.</i>    | <b>Mar. 2016</b> |
| <b>Master's degree in Information Science and Technology</b><br><i>Graduate School of Information Science and Technology, The University of Tokyo, Japan.</i> | <b>Mar. 2013</b> |
| <b>Bachelor's degree in Engineering</b><br><i>Faculty of Engineering, The University of Tokyo, Japan.</i>   | <b>Mar. 2011</b> |

## Teaching

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| <b>Applied Gaussian Process and Machine Learning</b><br><i>Graduate School of Information Science and Technology, The University of Tokyo, Japan.</i> | <b>6, Dec. 2021</b>                               |
| <b>Advanced Signal Processing</b><br><i>Graduate School of Information Science and Technology, The University of Tokyo, Japan.</i>                    | <b>23, June 2020 and 21, June 2022, June 2024</b> |
| <b>Student Experiment</b><br><i>Department of Mathematical engineering and information physics, The University of Tokyo, Japan.</i>                   | <b>Apr. 2020–Mar. 2023</b>                        |

## Languages

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Japanese (native), English (basic)

## Competitive Funds

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| <b>Variable-resolution audio processing framework<br/>adaptive to acoustic scenes</b><br><i>JSPS PRESTO (Fundamental Innovation for Real-World Intelligent Systems)</i> | <b>Apr. 2023–Mar. 2027</b> |
| <b>Development of deep-layered analysis-by-synthesis techniques for<br/>acoustic scene analysis with human intervention</b><br><i>JSPS KAKENHI</i>                      | <b>Apr. 2023–Mar. 2027</b> |
| <b>Sampling-frequency-independent deep learning for audio media processing</b><br><i>JST ACT-X (Frontier of Mathematics and Information Science)</i>                    | <b>Oct. 2021–Mar. 2024</b> |
| + 4 funds as representative, 5 funds as co-researcher, and 1 fund as research participants.   |                            |

## Publications

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### Journal Papers.....

- [1] Yuki Ito, Tomohiko Nakamura, Shoichi Koyama, Shuichi Sakamoto, and Hiroshi Saruwatari, "Spatial upsampling of head-related transfer function using neural network conditioned on source position and frequency," *IEEE Open Journal of Signal Processing*, vol. 6, pp. 1109–1123, Sept. 2025.
- [2] Yusaku Mizobuchi, Daichi Kitamura, Tomohiko Nakamura, Norihiro Takamune, Hiroshi Saruwatari, Yu Takahashi, and Kazunobu Kondo, "Music bleeding-sound reduction based on time-channel nonnegative matrix factorization," *APSIPA Transactions on Signal and Information Processing*, vol. 14, no. 1, e18, July 2025.
- [3] Yuto Ishikawa, Tomohiko Nakamura, Norihiro Takamune, Daichi Kitamura, Hiroshi Saruwatari, Yu Takahashi, and Kazunobu Kondo, "Real-time speech extraction based on rank-constrained spatial covariance matrix estimation and spatially regularized independent low-rank matrix analysis with fast demixing matrix estimation," *IEEE Access*, vol. 13, pp. 88683–88706, May 2025.
- [4] Kanami Imamura, Tomohiko Nakamura, Kohei Yatabe, and Hiroshi Saruwatari, "Neural analog filter for sampling-frequency-independent convolutional layer," *APSIPA Transactions on Signal and Information Processing*, vol. 13, no. 1, e28, Nov. 2024.
- [5] +8 papers

### Peer-Reviewed International Conferences and Workshops.....

- [1] Go Nishikawa, Wataru Nakata, Yuki Saito, Kanami Imamura, Hiroshi Saruwatari, and Tomohiko Nakamura, "Multi-sampling-frequency naturalness MOS prediction using self-supervised learning model with sampling-frequency-independent layer," in *Proceedings of IEEE Automatic Speech Recognition and Understanding Workshop*, Dec. 2025. (First and second authors contributed equally.)
- [2] Rinka Nobukawa, Makito Kitamura, Tomohiko Nakamura, Shinnosuke Takamichi, and Hiroshi Saruwatari, "Drum-to-vocal percussion sound conversion and its evaluation methodology," in *Proceedings of Asia Pacific Signal and Information Processing Association Annual Summit and Conference*, Oct. 2025.
- [3] Ryan Niu, Shoichi Koyama, and Tomohiko Nakamura, "Head-related transfer function individualization using anthropometric features and spatially independent latent representations," in *Proceedings of IEEE Workshop on Applications of Signal Processing to Audio and Acoustics*, Oct. 2025.
- [4] +37 papers

### Invited Talks.....

- [1] Tomohiko Nakamura, "Trends and prospects for audio source separation using deep learning," *Meeting on Technical Committee on Engineering Acoustics, IEICE*, Mar. 2025. (in Japanese)
- [2] Daichi Kitamura, Tomohiko Nakamura, "Fundamentals and applications of audio source separation — A guide to becoming an expert," *2023 Otagaki Symposium*, Jun. 2023. (in Japanese)
- [3] Tomohiko Nakamura, "Signal-processing-inspired deep learning," *IEEE NZ Signal Processing/Information Theory Joint Chapter in co-hosted by the Acoustics Research Centre, University of Auckland*, Dec. 2022.
- [4] +1 invited presentation

### Overview Papers.....

- [1] Shoichi Koyama, Juliano Ribeiro, Tomohiko Nakamura, Natsuki Ueno, and Mirco Pezzoli, "Physics-informed machine learning for sound field estimation: Fundamentals, state of the art, and challenges," *Special Issue on Model-Based and Data-Driven Audio Signal Processing, IEEE Signal Processing Magazine*, vol. 41, pp. 60–71, 2024.
- [2] Hirokazu Kameoka, Tomohiko Nakamura, and Norihiro Takamune, "Recent advances in music signal processing techniques," *The Journal of Institute of Electronics, Information and Communication Engineers*, vol. 98, no. 6, pp. 467–474, Jun. 2015. (in Japanese)

### Patents.....

- [1] Tomohiko Nakamura, "Object recognition device, method, and program," Japan Patent JP7349288, 13-Sept-2023.
- [2] Tomohiko Nakamura, "Object recognition device, method, and program," Japan Patent JP7349290, 13-Sept-2023.
- [3] +9 patents

## Awards

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- 1. The Awaya Kiyoshi Research Award, ASJ, Mar. 2024.
- 2. The Itakura Prize Innovative Young Researcher Award, ASJ, Mar. 2022.
- 3. +12 awards