**Issei Saito**

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**RESEARCH Summary**

**EDUCATION**

**WORK EXPERIENCE**

**RESEARCH EXPERIENCE**

**PUBLICATIONS**

(Domestic conference)

**PUBLICATIONS**

(International conference)

**PREPRINTS**

**Emergent communication, human behavior analysis using probabilistic generative model.**

I conduct research focused on modeling phenomena in the world using probabilistic approaches. My work involves developing models to uncover the processes behind emergent communication. I also collaborate with industry to create probabilistic models for application in worker behavior analysis.

**The University of Electro-Communications** April 2023 ~ present

M.S. in Mechanical and Intelligent Systems Engineering,

Advisor: Prof. Tomoaki Nakamura

**The University of Electro-Communications** April 2019 ~ March 2023

B.S. in Advanced Robotics Program, Cluster II (Emerging Multi-Interdisciplinary Engineering),School of Informatics and Engineering, Advisor: Prof. Tomoaki Nakamura

**Contractor at Avanti R&D, Inc.**June.2024 - Present

* Engaged in research and development, focusing on advanced technologies (details are confidential due to NDA).
* Developing tools for data analysis using Python to support project goals.
* Communicating in English to drive the project forward.

**Visiting researcher at SUNY Binghamton** Sep.2023 – June.2024

* Collaborative research with AIR group advised by Prof. Shiqi Zhang
* Research on emergent communication ( EC ) .
* The objective of this research is modeling the process of emergent symbol(language) between agents.
* We modeled how human generate and recognize the continuous signals (vocal language) using Probabilistic Generative Model (PGM). [publication 4]

**Teaching Assistant at UEC** Apr.2022 – Sep.2022

* Career Education, Prof. Toshinori Mathuki, Spring Semester 2022
* My duties involved assisting undergraduate students in learning.

1. **Issei Saito**, Tomoaki Nakamura, Toshiyuki Hatta, Wataru Fujita, Shintaro Watanabe, and Shotaro Miwa. Improving the accuracy of 3D skeletal position estimation using the Viterbi algorithm. The 55th National Convention of IPSJ (Information Processing Society of Japan), Vol2, page 321~322, March 2023
2. **Issei Saito**, Tomoaki Nakamura, Toshiyuki Hatta, Wataru Fujita, Shintaro Watanabe, and Shotaro Miwa. Analysis of work behavior using GP-HSMM-based double articulation analyzer*.* The Annual Conference of JSAI (The Japanese Society for Artificial Intelligence), June 2023
3. **Issei Saito**, Tomoaki Nakamura, Toshiyuki Hatta, Wataru Fujita, Shintaro Watanabe, and Shotaro Miwa, Unsupervised Work Behavior Analysis Using Hierarchical Probabilistic Segmentation, The 49th Annual Conference of the IEEE Industrial Electronics Society (IECON) October 16-19, 2023. Accepted
4. **Issei Saito**, Tomoaki Nakamura, Akira Taniguchi, Tadahiro Taniguchi, Yohei Hayamizu, and Shiqi Zhang, “Emergence of Continuous Signal as Shared Symbols Through Emergent Communication”, The IEEE International Conference on Development and Learning (ICDL) conference, May 20-23, 2024, accepted.
5. **Issei Saito**, Tomoaki Nakamura, Toshiyuki Hatta, Wataru Fujita, Shintaro Watanabe, and Shotaro Miwa, “Unsupervised Work Behavior Pattern Extraction Based on Hierarchical Probabilistic Model”, arXiv: 2405.09838, 2024.

**SKILLS**

**Others**

**Joint research with Advanced Technology R&D Center, Mitsubishi Electric Corporation as a researcher** August 2022 to present

* Research on an efficient work analysis system with our segmentation Algorithms.
* The aim of developing the system is to automate work analysis that is currently done by hand and improve productivity.
* I was in charge of improving and implementing the segmentation model.
* Programming Languages: Python, C, Ruby
* Research ability ( published 4 papers and 1 preprint)
* The knowledge of Bayesian inference
* English skill: IELTS 6.0
* Japanese native

**Offensive leader and Vice-Captain on the college’s American Football Team**

* Act as a team leader, 2022
* Communicate well and act responsibly in a group
* Strong heathy body