

YUANPENG QU

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EDUCATION

University of Tsukuba <i>PhD 3rd year in Intelligent and Mechanical Interaction Systems</i>	Ibaraki, Japan <i>Apr 2023 – Mar 2026 (Expected)</i>
University of Tsukuba (Num of A: 10/12) <i>Master of Engineering in Intelligent and Mechanical Interaction Systems</i>	Ibaraki, Japan <i>Apr 2021 – Mar 2023</i>
Zhuhai College of Jilin University (GPA: 3.87/4) <i>Bachelor of Engineering in Computer Science</i>	Zhuhai, China <i>Sept 2016 – July 2020</i>

RESEARCH EXPERIENCE

Intent-aware Diffusion for Sequential Recommendation <i>Ph.D. Research</i>	June 2024 – Present <i>University of Tsukuba, Ibaraki</i>
<ul style="list-style-type: none">• Model: Proposed InDiRec, a contrastive learning framework that combines intent clustering and conditional diffusion to generate semantically aligned augmented views for sequence embedding representation learning. Trained with a Transformer backbone (SASRec) using multi-task learning for recommendation, diffusion, and contrastive alignment.• Data: 5 public real-world datasets (e.g., Amazon Review, ML-1M), with over 2M user-item interaction records, preprocessed into sequential format (user_id item1 item2 ...) representing each user's behavior history.• Results: Achieved an average improvement of +13.2% in HitRate and +20.7% NDCG over strong baselines; maintained robust performance under sparse and noisy conditions. Accepted at SIGIR 2025 (Full paper track, Core A*).	
Latent-Guided Diffusion for Efficient Sequential Recommendation <i>Ph.D. Research</i>	Jan 2024 – Dec 2024 <i>University of Tsukuba, Ibaraki</i>
<ul style="list-style-type: none">• Model: Developed LGD4Rec, a generative framework combining VAE-based latent space encoding and diffusion modeling. Introduced latent-space-only diffusion and classifier-free personalized guidance to enable efficient and controllable item sequence generation.• Data: 4 benchmark datasets with user-item sequences preprocessed into latent representations via variational encoding.• Results: Achieved up to +9.7% HitRate and +7.7% NDCG improvements over strong baselines, with approximately 2× faster training than full-space diffusion models. Accepted at ICONIP 2024 (Oral).	
Explainable Recommendation via Filter-Enhanced Transformer <i>M.Sc. Research</i>	Jan 2022 – Dec 2023 <i>University of Tsukuba, Ibaraki</i>
<ul style="list-style-type: none">• Model: Proposed TSIER, a Transformer-based model with an FFT-based filter layer to extract clean time-series signals from user histories. Designed a modified attention mask to align predicted items with sequential context, enabling joint learning of recommendation and explanation tasks.• Data: Used Yelp, TripAdvisor, and Amazon datasets; each sample constructed as a 4-tuple consisting of the user's purchase history embedding, target item ID, review-based feature vector, and tokenized review text (Max 100 characters).• Results: Outperformed baselines with up to +2.0% on the explanation generation task and +3.9% on the sequential recommendation task, generating more relevant and interpretable explanations. Published in IEEE Access, 2024 (IF 3.4).	

SELECTED PUBLICATION

First author & Peer reviewed

- **Y. Qu** and H. Nobuhara: Intent-aware Diffusion with Contrastive Learning for Sequential Recommendation. In Proceedings of the 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR), Padua, Italy, July 13-18, 2025. **[Just Accepted, Core A*]**
- **Y. Qu** and H. Nobuhara: Intent Representation Learning for Sequential Recommendation via Latent Guided Diffusion. 31st International Conference on Neural Information Processing (ICONIP), Auckland, New Zealand, Dec 2-6, 2024.
- **Y. Qu** and H. Nobuhara, "Generating Explanations for Explainable Recommendations Using Filter-Enhanced Time-Series Information," in IEEE Access, vol. 12, pp. 78480-78495, 2024.
- **Y. Qu** and H. Nobuhara: Explanation Generated for Sequential Recommendation Based on Transformer Model. Joint 12th International Conference on Soft Computing and Intelligent Systems and 23rd International Symposium on Advanced Intelligent Systems (SCIS&ISIS), Ise-Shima, Mie, Japan, Nov 29 - Dec 2, 2022. **[Best Student Presentation Award]**

PROJECTS EXPERIENCE

Matrix Factorization-based Job Recommendation System

Jan 2023 – Aug 2023

Python, Java, Pytorch, SpringBoot, MongoDB, Redis, React

ML Web System, Tokyo

- Built a personalized job-matching system to address response delays and low recommendation precision in traditional online recruitment platforms.
- Collected and cleaned data from 100k+ job listings and 10k+ companies via web crawling, storing results in MySQL and MongoDB databases.
- Designed a two-stage hybrid recommendation architecture:
 - Offline module: Applied Matrix Factorization to decompose the user-job interaction matrix into low-dimensional latent vectors and reconstructed predicted scores via matrix multiplication, enabling personalized job ranking.
 - Online module: Deployed real-time recommendation engine using cosine similarity over latent vectors with loss-based adjustment; achieved sub-300ms response via Redis caching.
- Developed a web-based interface using SpringBoot (Java) and React (HTML/CSS/JavaScript); supported search, login, and personalized recommendations; tested with 500+ users during pilot.

Smart Plant Pot R&D

June 2022 – Mar 2023

Python, C, ESP32, OpenCV

AI-IoT Project, Tokyo

- Designed and built a desktop smart plant pot equipped with multiple sensors (humidity, temperature, image sensor, etc.), a display and interactive components using ESP32 and Python.
- Integrated YOLO and OpenCV for real-time face tracking via an onboard camera and IR sensor, enabling synchronized eye-movement display on the plant pot.
- Enabled basic human-plant interaction through a trained voice model and a built-in display, while using multi-sensor data and condition-based logic to support essential environmental factors for healthy plant growth.
- Completed development and successfully delivered the product for mass production at the partner company, serving as a core member of a small team and leading the technical design & main implementation.

Full-Stack Development for Web-Based Systems

June 2019 – Oct 2020

Java, SpringMVC, MySQL, React

Contest, Independent Project, Jilin

- Designed and developed multiple full-stack web applications, including a logistics scheduling system & dashboard (for a supply chain competition), an online bookstore, and an e-commerce platform.
- Implemented core business logic using the Java SpringMVC framework, managed relational data with MySQL, and integrated third-party APIs (e.g., shipping, payment, product search).
- Built responsive user interfaces with HTML/CSS/JavaScript and React, supporting real-time interactions, order tracking, and user authentication.
- Built modular components for inventory tracking and logistics visualization, improving maintainability and real-time responsiveness.

SKILLS

- **Expertise:** Recommender System, Sequential Recommendation, Diffusion Models, Contrastive Learning, Multi-task Learning, Variational Autoencoders, Transformer, Latent Intent Modeling & Disentanglement, Explanation Generation, Item Embedding Generation, User Behavior Analysis, Causal Inference
- **Programming languages:** Python, Java, C/C++, JavaScript, HTML/CSS, SQL, Linux, Latex
- **Frameworks & Tools:** Pytorch, Tensorflow, Scikit-learn, NumPy, SpringBoot, MongoDB, React, Node.js
- **Languages:** Japanese (Fluent, JLPT N1), English (Fluent, TOEIC 845, TOEFL 85), Chinese (Native)
- **Qualifications:** Regular driver's license (AT)
- **Interest:** Travel, Photography, Badminton

AWARDS

- Selected for the JST SPRING Program (Next-Gen Research Fellowship, \$20,000/year)
- Won the Best Student Presentation Award at the international conference SCIS&ISIS 2022
- Selected as an Outstanding Graduate, 2020
- Awarded First-Class Scholarship for three consecutive years, 2017 – 2020
- Received the Outstanding Student Award for three consecutive years, 2017 – 2020