

# YUANPENG QU

📍 Tsukuba, Ibaraki, Japan  
☎ +81 80-7370-5065 | 🌐 [github.com/qyp9909](https://github.com/qyp9909) | ✉ [qu@cmu.iit.tsukuba.ac.jp](mailto:qu@cmu.iit.tsukuba.ac.jp)

## EDUCATION

### University of Tsukuba

PhD 3rd year in Intelligent and Mechanical Interaction Systems

Ibaraki, Japan

Apr 2023 – Mar 2026 (Expected)

### University of Tsukuba (Num of A: 10/12)

Master of Engineering in Intelligent and Mechanical Interaction Systems

Ibaraki, Japan

Apr 2021 – Mar 2023

### Jilin University (GPA: 3.87/4)

Bachelor of Engineering in Computer Science

Jilin, China

Sept 2016 – July 2020

## RESEARCH EXPERIENCE

### Intent-aware Diffusion for Sequential Recommendation

Ph.D. Research

June 2024 – Present

University of Tsukuba, Ibaraki

- **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

Ph.D. Research

Jan 2024 – Dec 2024

University of Tsukuba, Ibaraki

- **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, Core A).

### Explainable Recommendation via Filter-Enhanced Transformer

M.Sc. Research

Jan 2022 – Dec 2023

University of Tsukuba, Ibaraki

- **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 of Jilin University, 2020
- Awarded First-Class Scholarship for three consecutive years, 2017 – 2020
- Received the Outstanding Student Award for three consecutive years, 2017 – 2020