PU, XINYI

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Education

Pratt Institute, New York Aug 2023 - Present
Master of Industrial Design (Global Innovation Design Program)
Courses: Digital Ideation, Sound Design, Color, ID Tech, Design Issues in 21st Century

Keio University, Tokyo *(Exchange Program)* Mar 2025 - Jul 2025
Courses: Real Project, Perception Aware Computing

Imperial College + Royal College of Art, London *(Exchange Program)* Sep 2024 - Dec 2024
Courses: Cyber Physical System

Fudan University Sep 2018 – Jun 2023
B.S. in Mathematics and Applied Mathematics, B.A. in Philosophy (Religious Studies)
Courses: Mathematical Modeling, Mathematical Methods for Intelligent Manufacturing

Publication

[1] **Pu, X.**, Liu, Y., Zhang, L., Li, Y., & Yuan, Y. (2025). *Conjugate Breathing: A Tension Between Human and Sea.* In *DIS Companion '25*, 163–168. ACM.

[2] ***Pu, X.**, Xu, C., *Li, Y., Yuan, Y., Lee, T., Ye, C., Zhang, L., & Duan, J. (2025). *Volitional vs. Forced: A Field Study of Just-in-Time Interventions for Digital Attention Recovery.* In *UbiComp Companion '25*. ACM. (Accepted)

[3] Qu, N., Mo, J., Liu, L., **Pu, X.**, Zhang, S., & Wang, Q. (2025). *ShoulDex: A Panel-Woven Textile Sensing System for Rotator Cuff Rehabilitation.* In *UbiComp Companion '25*. ACM. (Accepted)

[4] **Pu, X.**, Liu, Y., Ye, C., Duan, J., & Yamaoka, J. (2025). *AromaTrace: Reclaiming Olfactory Agency through Friction-Based Smell Printing.* (Under preparation)

Research Experience

Thesis Project, Pratt Institute, School of Design New York
Supervisor: *Alexander Schweder, Professor* Sep 2025 – Present
Independent Researcher| **Topic:** Knitted Musical Interface for Embodied Sound Performance

• Developing a soft, knitted interface that transforms touch and gesture into musical expression, exploring the embodied relationship between fabric, motion, and sound.

• Integrating conductive yarn sensors with MIDI mapping to translate textile deformation into dynamic audio feedback.

• Investigating the aesthetic and performative dimensions of tangible sound interfaces through iterative prototyping and user study.

GID Program, Royal College of Art / Keio University London, Yokohama
Supervisor: John Stevens & Gareth Loudon, Junichi Yamaoka Oct 2024 – Jul 2025
Independent Researcher | **Project:** *AromaTrace: Friction-Based Smell Printing*

- Developed a friction-triggered 2D smell-printing system (PyQt interface, SVG color parsing, scent–color mapping, per-scent G-code) for customizable olfactory interaction.
- Evaluated haptic–olfactory resolution (±0.3 mm spatial accuracy, temporal persistence, cross-scent discrimination) and ran a pilot study (N = 8).
- Found interactions highly novel but benefiting from visual cues;

CDI Lab, Tongji University Shanghai

Supervisor: Qi Wang, Associate Professor Jan 2025 - Apr 2025, Aug 2025

Research Assistant | **Topic:** *Wearable Sensor System for Detecting Shoulder Compensation*

- Employed a panel-woven sensing garment (14 sensors) synchronized with optical motion capture (27 joint angles) to train a **multi-head LSTM model (≤ 3° pre-training error)** for joint-angle prediction.
- Built a compensation recognition pipeline by selecting key features with **K-means clustering** and training an **SVM classifier**, achieving **96% offline accuracy**, with real-time deployment in progress.
- Optimizing preprocessing and model accuracy, focusing on joint-angle deviation, compensation onset time, and movement smoothness.

Perception Aware Computing Project, Keio University Yokohama

Supervisor: Kai Kunze, Professor Apr 2025 – May 2025

Independent Researcher | **Topic:** *Volitional control in attention management*

- Studied how intervention timing and volitional control affect digital attention restoration via a within-subject in-the-wild design (N = 14) grounded in Locus of Control theory.
- Coordinated two Android system variants, leading requirement specification, architecture design, and iterative usability refinement with UI designers.
- Analyzed 50+ self-reported tasks, 200+ self-evaluations, and 17,708 app switch logs; applied Fisher's exact test to behavioral metrics, finding improved task initiation after volitional commitments; first-author poster accepted at *UbiComp 2025*.

Future Lab, Tsinghua University Remote

Project PI: Prof. YINGQING XU Apr 2025 – August 2025

Research Collaborator | **Topic:** *Topic Modeling of Interview Transcripts*

- Applied **BERTopic neural topic modeling** to cluster **semi-structured interview transcripts**, uncovering latent themes and conflicts.
- Produced interpretable topic clusters that supported the research team's design of follow-up studies on sensemaking and trust.

Undergraduate Thesis, Fudan University Shanghai

Supervisor: Zhenyun Qin, Associate Professor Mar 2023- May 2023

Independent Researcher | **Topic:** *GNN Residual Connection Optimization*

- Proposed an improved residual connection mechanism for Graph Neural Networks to enhance stability in deep architectures.
- Implemented and benchmarked the approach on citation and molecular datasets, showing up to 7% accuracy improvement over baseline GCN/ResGCN models.

SKILLS & INTERESTS

Programming & Data Analysis: Python (data preprocessing, statistical analysis, PyTorch basics), MATLAB (signal processing, kinematic data analysis), Processing

Design & Prototyping: Unity (VR/AR prototyping), UE, TouchDesigner, Figma, Photoshop, PyQt, 3D modeling/CAD (Maya, TopMod, Rhino & Grasshopper, SolidWorks)

Hardware & Fabrication: Motion capture (OptiTrack), wearable sensor integration, Arduino, 3D printing (direct-write, multi-material, G-code generation)， Digital knitting (In progress)

Sound & Media: Ableton Live, Audition, Premiere Pro, After Effects