

Ding Xia

DOCTORAL STUDENT

UI Lab, IST, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-0033, Tokyo, Japan

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Research Interests

Human-Computer Interaction	External Human-Machine Interface (eHMI), Fabrication, Interactive System Design, Trust Evaluation
Language & Vision Models	LLMs, VLMs, Fine-tuning, Prompt Engineering
Computer Vision	Image Registration, Neural Radiance Fields (NeRF), Gaussian Splatting, VGGT
Other Fields	Diffusion Models, Brain-Computer Interface, Object Detection, User Studies

Education

The University of Tokyo

Tokyo, Japan

PHD IN CREATIVE INFORMATICS, DEPARTMENT OF CREATIVE INFORMATICS, IST

Apr. 2022 - Present (expected Sept. 2026)

- Research focus on Large Language Models (LLMs) and Vision-Language Models (VLMs) applications for external Human-Machine Interface (eHMI) in autonomous vehicles and robotics, supervised by [Prof. Takeo Igarashi](#)
- Developed novel framework using LLMs as eHMI control action designers to solve adaptation challenges in complex real-world scenarios, implemented using Python and Blender with state-of-the-art language and vision models
- Pioneered the introduction of LLMs to eHMI research domain, facilitating practical deployment of eHMI systems in real-world applications with ongoing publication submission to EMNLP 2025
- Collaborated closely with [Xinyue Gui](#), [Xi Yang](#), and [Tsukada Lab](#) for interdisciplinary research in LLM usage, evaluation, and fine-tuning

South China University of Technology

Guangzhou, China

MASTER OF ENGINEERING, SCHOOL OF AUTOMATION SCIENCE AND ENGINEERING

Sept. 2017 - Jun. 2020

- Graduation Thesis: Semi-supervised Classification of Brain Signals Based on VAE Framework, supervised by [Prof. Zhenghui Gu](#)
- Enhanced VAE framework with novel loss function for P300 signal classification in brain-computer interface applications, implemented using Python and TensorFlow
- Achieved improved performance over baseline by addressing limited labeled data challenges through semi-supervised learning approach
- Key Courses: Digital Signal Processing, Pattern Recognition, Computer Vision, Convex Optimization

South China University of Technology

Guangzhou, China

BACHELOR'S DEGREE OF ENGINEERING, SCHOOL OF AUTOMATION SCIENCE AND ENGINEERING

Sept. 2013 - Jun. 2017

- GPA: 3.65/4.0 (ranking 2/17), Outstanding Defense Award for graduation thesis
- Graduation Thesis: Research on Single Image Depth Estimation Algorithm Based on Probability Graph Model, supervised by [Prof. Zhuliang Yu](#), implemented using MATLAB with superpixel segmentation and regression analysis
- Served as department leader in Student Union, developing leadership and organizational skills
- Key Courses: Calculus, C++, Signal Processing and Analysis

Work Experience

CyberAgent AI Lab

Tokyo, Japan

RESEARCH INTERN

March 2024 - Oct. 2025

- Conducted research on color design systems for vector graphic documents under the supervision of [Dr. Naoto Inoue](#)
- Implemented and accelerated internal tools for palette-based photo recoloring (based on ACM SIGGRAPH 2015 paper) using Python, with tools later utilized in subsequent research papers and product development
- Developed "ColorGPT" framework using LangChain, advanced prompt engineering techniques, and explored fine-tuning approaches for LLM-based color recommendation systems
- Achieved superior performance with experimental results demonstrating that the LLM-based pipeline outperformed existing methods in color suggestion accuracy and color palette completion tasks
- Published research findings at ICDAR 2025 (poster presentation), demonstrating the effectiveness of LLM-based approaches for color recommendation in design workflows

Corpy & Co.

Tokyo, Japan

SOFTWARE ENGINEERING INTERN

Sept. 2023 - Feb. 2024

- Collaborated with [Shuangshuang Alice Rao](#) on Standardization of Work Through Task Analysis Project, developing annotation tools, conducting model training, and implementing research paper methodologies
- Developed custom eye gaze tracking annotation tools by modifying [Labelme](#) using Python
- Performed extensive data annotation for task-specific industrial parts and eye gaze patterns of factory workers, supporting computer vision applications in object recognition, mask segmentation, and gaze tracking
- Delivered factory task analysis system prototype to customers as project outcome

- Conducted medical image registration and computer graphics research under [Prof. Takeo Igarashi](#) and collaborated with [Prof. Kin Taichi](#)
- Developed patch-based preregistration method for multi-modality 3D medical images (CT and 3DRA) using Python/PyTorch, achieving improved accuracy compared to existing methods by addressing varying image sizes through standardized patch processing
- Created end-to-end DICOM processing pipeline facilitating clinical image registration workflows
- Published research findings at MICCAI 2022, demonstrating reliable preregistration solutions for clinical applications
- Designed interactive desktop application using Unity/C# for ongoing research on deformable registration between 2D intraoperative images and 3D brain models, with PyTorch-based ML components and Unity-based visualization

Scholarships & Awards

2022-2025	SPRING GX Fellowship , Fostering Advanced Human Resources to Lead Green Transformation (GX)
2017	Outstanding Defense Award , Bachelor's Graduation Thesis Defense
2016	First Prize (top 8%) , China Undergraduate Mathematical Contest in Modeling

Professional Service

2025	Reviewer , Pacific Graphics
2024	Reviewer , Winter Conference on Applications of Computer Vision (WACV)

Publications

Automating eHMI Action Design with LLMs for Automated Vehicle Communication	<i>arXiv preprint arXiv:2505.20711</i>
XIA D, GUI X, GAO F, LI D, COLLEY M, IGARASHI T	2025

HealthGenie: Empowering Users with Healthy Dietary Guidance through Knowledge Graph and Large Language Models	<i>arXiv preprint arXiv:2504.14594</i>
GAO F, ZHAO X, XIA D , ZHOU Z, YANG R, LU J, JIANG H, PARK C, LI I	2025

Draw2Cut: Direct On-Material Annotations for CNC Milling	<i>Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems</i>
GUI X*, XIA D* , GAO W, DOGAN MD, LARSSON M, IGARASHI T (*CO-FIRST AUTHORS)	2025: 1-17

PairingNet: A Learning-based Pair-searching and-matching Network for Image Fragments	<i>European Conference on Computer Vision</i>
ZHOU R, XIA D , ZHANG Y, PANG H, YANG X, LI C	2024: 234-251

SpaceEditing: A Latent Space Editing Interface for Integrating Human Knowledge into Deep Neural Networks	<i>Proceedings of the 29th International Conference on Intelligent User Interfaces</i>
WEI J, XIA D , XIE H, CHANG CM, LI C, YANG X	2024: 489-503

A Two-Step Surface-Based 3D Deep Learning Pipeline for Segmentation of Intracranial Aneurysms	<i>Computational Visual Media</i>
XIA D , YANG X, VAN KAICK O, KIN T, IGARASHI T	2023, 9(1): 57-69

Data-Driven Multi-modal Partial Medical Image Preregistration by Template Space Patch Mapping	<i>International Conference on Medical Image Computing and Computer-Assisted Intervention</i>
XIA D , YANG X, VAN KAICK O, KIN T, IGARASHI T	2022: 259-268

Intra: 3D Intracranial Aneurysm Dataset for Deep Learning	<i>Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition</i>
YANG X, XIA D , KIN T, IGARASHI T	2020: 2656-2666 (Oral)