

Lu Dong

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Generative AI/ Computer Vision / LLMs

Personal Homepage
LinkedIn: Lu Dong

I'm pursuing my Ph.D. at the University at Buffalo-SUNY (UB). My research interests are Generative AI, Language-driven Motion Generation, Situated Intelligence, 3D Human Pose Estimation, Robotic Physics Simulation, and Sign Language Translation and Generation, primarily in developing Computer Vision, Large Language Models, Reinforcement Learning, Statistic Machine Learning, and Mathematical Modeling to study different human behaviors and make generative models more effective in serving human needs. I'm also experienced with Data Science, Pattern Mining, Information Retrieval, and Search Engine.

EDUCATION

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| State University of New York at Buffalo (UB) , Buffalo, New York, USA. | 08/2021-Now |
| • Ph.D candidate in Computer Science & Engineering | Advisor: Prof. Ifeoma Nwogu |
| Rochester Institute of Technology , Rochester, New York, USA. | 08/2020-05/2021 |
| • Ph.D candidate in Computing and Information Sciences | Advisor: Prof. Ifeoma Nwogu |
| Xi'an Jiaotong University , Xi'an, Shaanxi, China. | 08/2013-05/2016 |
| • Master's Degree in Computer Science and Technology | Advisor: Prof. Xinyu Yang |
| Northeast Electric Power University , Jilin, Jilin, China. | |
| • Bachelor's Degree in Computer Science and Technology | 08/2007-05/2011 |
| • Bachelor's Degree in Electrical Engineering and Automation | 08/2008-05/2012 |

RESEARCH EXPERIENCE

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| National AI Institute for Exceptional Education, University at Buffalo-SUNY, Buffalo, NY, USA. | 01/2024-Now |
| <i>Position: Research Assistant, Advisor: Ifeoma Nwogu</i> | |
| • Research Focus: Nonverbal Communication Modeling for Exception Children's Education | |
| – Topic: Open-Set Facial Affective Analysis for Complex Emotions with LLMs. (LLaVA, ChatGPT, and LoRA) | |
| – Topic: Empathetic AI Embodied Agent in Dyadic Interactions. (3D Motion Diffusion, Gaussian Splatting, Situated Awareness) | |
| – Topic: Integrating Generative Models with Robotic Systems and Case Studies. (Physical Simulations) | |
| Human Behavior Modeling Lab, University at Buffalo-SUNY, Buffalo, NY, USA. | 08/2021-Now |
| <i>Position: Research Assistant, Advisor: Ifeoma Nwogu</i> | |
| • Research Focus: Multimodal Modeling of Human Behavior and AI-Generated Content (AIGC). | |
| – Topic: Multimodal Whole-Body Motion Generation with Diffusion Models and Large Language Models. [SignGen] | |
| – Topic: 3D Sign Language Motion Reconstruction and Generation. [SignAvatar] | |
| – Topic: Language-guided Human Motion Synthesis with Atomic Actions. [ATOM] | |
| YLAB, Xi'an Jiaotong University, Xi'an, Shaanxi, China. | 08/2013-06/2016 |
| <i>Position: Research Assistant, Advisor: Xinyu Yang</i> | |
| • Research Focus: Exploring the Enduring MEME of Traditional Folk Songs | |
| – Topic: Unveiling Chinese Folk Songs' Melodic Characteristics via Machine Learning. | |
| – Topic: Towards a Systematic Classification and Benchmarking of Traditional Chinese Folk Songs. | |

WORK EXPERIENCE

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| InnoPeak Technology (OPPO US Research), Seattle, WA, USA. | 06/2023-08/2023 |
| <i>Position: Research Internship, Mentor: Dr. Mitch Hill and Dr. Guo-Jun Qi</i> | |
| • Focus: Text-Driven Multi-Person Motion Synthesis. This work is currently under review for ECCV 2024. | |
| • Achieve: We introduced the first generative model for controllable numbers of people and realistic multi-person interactions. | |
| InnoPeak Technology (OPPO US Research), Palo Alto, CA, USA. | 05/2022-08/2022 |
| <i>Position: Research Internship, Mentor: Dr. Xun Xu and Dr. Shuxue Quan</i> | |
| • Focus: Human Pose Estimation under Severe Self-Occlusion Challenges. | |
| • Achieve: Our results outperform "Midepipe" on public and in-house datasets, and have been integrated into the home gym app. | |
| Shaanxi Haina Electronic Technology Co., LTD, Xi'an, Shaanxi, China. | 09/2016-04/2020 |
| <i>Position: Senior Data Scientist</i> | |
| • Focus: Recommendation System. | |
| • Achieve: Developed and Optimized the Recommendation System and the Information Collection and Retrieval System. | |
| • Achieve: Ensured System Stability and Provided Sustained Support to over 100 Customer Companies. | |

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PUBLICATIONS

1. **Lu Dong**, Lipisha Nitin Chaudhary, Fei Xu, Xiao Wang, Mason Lary, Ifeoma Nwogu. "SignAvatar: Sign Language 3D Motion Reconstruction and Generation." *The 18th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2024)*.
2. **Lu Dong**, Xiao Wang, Mason Lary, Ifeoma Nwogu. "SignGen: Semantically-Guided American Sign Language Generation." *ACL 2024* (under review).
3. Mengyi Shan, **Lu Dong**, Yutao Han, Yuan Yao, Tao Liu, Ifeoma Nwogu, Guo-Jun Qi, Mitchell Hill. "Towards Open Domain Text-Driven Synthesis of Multi-Person Motions." *ECCV 2024* (under review).
4. Fei Xu, Lipisha Nitin Chaudhary, **Lu Dong**, Srirangaraj Setlur, Venu Govindaraju, Ifeoma Nwogu. "A Study of Video-based Human Representation for American Sign Language Alphabet Generation." *(FG 2024)*.
5. Yuanhao Zhai, Mingzhen Huang, Tianyu Luan, **Lu Dong**, Ifeoma Nwogu, Siwei Lyu, David Doermann, Junsong Yuan. "Language-guided Human Motion Synthesis with Atomic Actions." In *Proceedings of the 31st ACM International Conference on Multimedia, 2023*, pp. 5262-5271. (ACM MM'23)
6. Juan Li, **Lu Dong**, Jianhang Ding, Xinyu Yang. "Exploring the General Melodic Characteristics of XinTianYou Folk Songs." In *12th Sound and Music Computing Conference, Maynooth, Ireland, 2015*, pp. 393-399. (SMC)

PROJECT EXPERIENCE

Information Retrieval Project -Covid19 & Vaccine Analysis Search Engine [\[Page Link\]](#)

09/2021-12/2021 @UB

- Regarding COVID and Vaccines, I collected a dataset of 50,000 tweets from diverse languages, various countries, authorities, and the general public using Tweepy. The front-end utilizes a Google-like user interface with HTML, CSS, Bootstrap, JavaScript, and Ajax techniques. The back-end using the Flask server, deployed on AWS EC2 cloud, employs statistical models and semantic-based language analysis to track trends among authorities related to COVID-19, public attitudes toward vaccines, and their impacts.

Natural Language Processing Project- Medical Tutoring ChatBot [\[Page Link\]](#)

09/2021-12/2021 @UB

- This project supports a non-profit organization's mission to enhance medical knowledge in underdeveloped regions of India. My contributions addressed obstacles such as developing databases from PDFs, implementing accessible chatbots, and generating high-quality dialogue to maintain user engagement. The chatbot functions as a vital educational resource, elevating medical literacy and potentially saving lives.

Reinforcement Learning Project -Multi-Agent Collaborative Reinforcement Learning

09/2021-12/2021 @UB

- My project focused on developing an RL Learning system within the OpenAI Gym Environment, incorporating various reinforcement learning algorithms, including Q-Learning, SARSA, DQN, DDQN, Actor-Critic, and especially PPO. It excels in multi-agent cooperation tasks featuring dynamic reward systems and establishes benchmarks.

PROFESSIONAL SERVICE

Conference Reviewer

- ACM International Conference on Multimedia, 2023.

Journal Reviewer

- Springer Nature, Machine Vision and Applications, 2024.

Competition

- Invited Judge for UB Hacking Competition, 2022.

HONORS AND AWARDS

Excellent Graduate Student(Top 15%), Xi'an Jiaotong University, 2014 & 2015.

Silver Medal in University Women's Hurdles Competition, Xi'an Jiaotong University, 2014.

National Graduate Academic Scholarship (Top 15%), Xi'an Jiaotong University, 2013-2016.

Excellent Student Leadership(Top 3%), Northeast Electric Power University, 2010.

National Encouragement Scholarship (Top 5%), Northeast Electric Power University, 2010.

Undergraduate Academic Scholarships(Top 10%), Northeast Electric Power University, 2010 .

Excellent Undergraduate Student(Top 10%), Northeast Electric Power University, 2010 &2011.

First Prize in University Women's Basketball Competition as Team Captain, Northeast Electric Power University, 2010.