Shuyue Jia (Bruce)

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CONTACT INFORMATION

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Residence: Beijing, China & Xinzhou, Shanxi, China

Previous Residence: Jilin, Jilin, China & Kowloon, Hong Kong, China & Irvine, CA, USA

Special Notice: Hong Kong SAR Resident & Hong Kong IANG Working VISA Holder

RESEARCH INTERESTS AND STATEMENT

I am a Ph.D. student working on

- **AI Foundation Models**, *e.g.*, Pre-trained Large Language Models (LLMs)
- **Generative AI**, *e.g.*, Diffusion Probabilistic Models
- **Reasoning with Foundation Models**, *e.g.*, equip LLMs with strong mathematical reasoning capability
- **Visual and Language Multimodal Learning**, *e.g.*, CLIP
- **AI for Medicine and Healthcare**, *e.g.*, Medical Imaging with AI
- **Trustworthy AI**

My ultimate goal is to **develop safe, reliable, and extensible Artificial General Intelligence systems** that can improve human lives. Source codes of all my works will be shared on GitHub, the trained models and datasets will be released on 🤗 Hugging Face, and some of my applied research on Vision and Language will be developed as Web or Android/iOS mobile apps.

ACADEMIC APPOINTMENTS

City University of Hong Kong, Hong Kong SAR   **Research Assistant**   Sept 2021 - Apr 2023

- Supervisor: Prof. Shiqi Wang
- Project: Image Quality Assessment (IQA) and Perceptual Optimization

EDUCATION

Boston University, Boston, Massachusetts, USA   Sept 2023 - Present

- Ph.D. in Computer Engineering, Department of Electrical and Computer Engineering
- Supervisor: Prof. Vijaya B. Kolachalama @ Kolachalama Laboratory @ BU
- Expertise: Foundation Models, Generative Models, Vision and Language Multimodal Learning, Medical Imaging
- Financial Aids: Distinguished Computer Engineering Fellowship (USD $39,780 per year)

City University of Hong Kong, Hong Kong SAR, China   May 2021 - June 2023

- M.Phil. in Computer Science, Department of Computer Science
- Supervisor: Prof. Shiqi Wang
- Expertise: Image Quality Assessment and Perceptual Optimization
- Thesis: No-reference Image Quality Assessment via Non-local Modeling
- Financial Aids: Research Assistantship (HKD $13,000 per month)

Northeast Electric Power University, Jilin, Jilin, China ⟶ Sept 2016 - Jun 2020

- B.Eng. in Intelligence Science and Technology, School of Automation Engineering
- Supervisor: Prof. Yimin Hou, Prof. Jinglei Lv, and Prof. Yang Li
- Expertise: Neural Networks (Deep Learning)
- Thesis: Brain-computer Interface Signals Classification and Its Applications based on Deep Learning Methods
- Creator and Maintainer of GitHub repo **EEG-DL** (obtained 780+ stars and 200+ forks), a Deep Learning library written by TensorFlow for EEG Tasks (Signals) Classification

University of California, Irvine, Irvine, California, USA ⟶ Jul - Sept 2017

- Visiting Student, Summer School, Department of Computer Science
- Selected coursework: Computer Systems and Architecture (A+), University Writing and Communication (Pass)

Peer-reviewed Publications

Journal Publications

- GCNs-Net: A Graph Convolutional Neural Network Approach for Decoding Time-resolved EEG Motor Imagery Signals [Paper] [Codes] [Slides] [Survey]
  Shuyue Jia, Yimin Hou, Xiangmin Lun, Ziqian Hao, Yan Shi, Yang Li, Rui Zeng, Jinglei Lv *
  IEEE Transactions on Neural Networks and Learning Systems (IEEE T-NNLS)
   GitHub Repo obtained 780+ stars and 200+ forks

- Deep Feature Mining via Attention-based BiLSTM-GCN for Human Motor Imagery Recognition
  Shuyue Jia *, Yimin Hou, Xiangmin Lun, Shu Zhang, Tao Chen, Fang Wang, Jinglei Lv [Paper] [Codes] [Slides]
  Frontiers in Bioengineering and Biotechnology

- A Novel Approach of Decoding EEG Four-Class Motor Imagery Tasks via Scout ESI and CNN [Paper] [Codes]
  Yimin Hou, Lu Zhou *, **Shuyue Jia**, Xiangmin Lun
  Journal of Neural Engineering
   GitHub Repo obtained 150+ stars and 40+ forks

- PMU Measurements based Short-term Voltage Stability Assessment of Power Systems via Deep Transfer Learning [Paper]
  Yang Li *, Shitu Zhang, Yuanzheng Li, Jiting Cao, **Shuyue Jia**
  IEEE Transactions on Instrumentation and Measurement (IEEE T-IM)

- Learning from Mixed Datasets: A Monotonic Image Quality Assessment Model [Paper] [Codes]
  Zhaopeng Feng, Keyang Zhang, **Shuyue Jia**, Baoliang Chen, Shiqi Wang *
  IET Electronics Letters

- Improving Performance: A Collaborative Strategy for the Multi-data Fusion of Electronic Nose and Hyperspectral to Track the Quality Difference of Rice [**E** Paper]
  Yan Shi, Hangcheng Yuan, Chenao Xiong, **Shuyue Jia**, Jingjing Liu, Hong Men *
  Sensors & Actuators: B. Chemical

- Origin Traceability of Rice based on an Electronic Nose Coupled with a Feature Reduction Strategy [ẟ Paper]
  Yan Shi, Xiaofei Jia, Hangcheng Yuan, **Shuyue Jia**, Jingjing Liu, Hong Men *
  Measurement Science and Technology

Conference and Workshop Publications

- No-reference Image Quality Assessment via Non-local Dependency Modeling [◆ Paper] [⌀ Codes] [▉ Slides] [▉ Poster]
  Shuyue Jia, Baoliang Chen, Dingquan Li, Shiqi Wang *
  IEEE 24th International Workshop on Multimedia Signal Processing (IEEE MMSP'22) (Poster Presentation)

Thesis

- No-reference Image Quality Assessment via Non-local Modeling [▉ Permanent Link] [▉ Defense Slides]
  Shuyue Jia
  M.Phil. Thesis, City University of Hong Kong, May 2023.

Note:
1. ẟ Google Scholar Profile
2. * denotes the Corresponding Author.

OPEN-SOURCE PROJECTS AND DATASETS

Library - **EEG Deep Learning Library** (780+ stars and 200+ forks) [⌀ Code]
- EEG-DL is a Deep Learning (DL) library written by TensorFlow for EEG tasks (signals) classification.

Toolkit - **PromptCraft** [⌀ Code] [PyPI Package]
- PromptCraft is a prompt perturbation toolkit from the character, word, and sentence levels for prompt robustness analysis.

Benchmark Dataset - **GSM8K-Consistency** [Dataset (available on 🤗 Hugging Face)]
- GSM8K-Consistency is a benchmark database for analyzing the consistency of Arithmetic Reasoning on GSM8K.

Paper Survey - **Awesome LLM Self-Consistency** [⌀ Repo]
- Awesome LLM Self-Consistency is a curated list of self-consistency in Large Language Models (LLMs).

Paper Survey - **Awesome Semantic Textual Similarity (STS)** [⌀ Repo] [▉ Slides]
- Awesome Semantic Textual Similarity is a curated list of Semantic/Sentence Textual Similarity (STS) in Large Language Models and the NLP Field.

INDUSTRY EXPERIENCE

Samsung Research, Beijing   **Computer Vision Research Intern**   May - Jun 2022
- Research Proposal: Temporally Consistent Instance Tracking for Video Panoptic Segmentation (VPS).
- Temporally consistent Instance Association: object high-level correspondence (instance embedding association) in consistency with the pixel low-level correspondence (optical flow).
- Generate Dense Mask: wrote scripts to generate dense masks by linear interpolation from the sparse masks.
  (Mentor: Dr. Hui Zhang)

Philips Research, Shanghai   **NLP Research Intern**   Jul - Oct 2020

- Medical Concept Mapping: three levels to map the query to a standard term → BPE and FMM & BMM algorithms for sub-words generation and matching (syntax-level), word vector cosine similarity (semantics-level), and knowledge graph (pragmatics-level).
- Medical Terms NER: compared the performances of different models → CRF++, Character-level BiLSTM + CRF, Character-level BiLSTM + Word-level BiLSTM / CNNs + CRF, and deployed the models using Flask and Docker as web apps.
- Dynamic Webs Crawling: crawled 620,000 words from the NSTL via python parallel package threading and other tricks to prevent anti-reptile.
  (Mentor: Dr. Shuang Zhou)

AWARDS AND SERVICES

Fellowships and Scholarships

Distinguished Computer Engineering Fellowship, Boston University, USA	2023 - 2024
Research Assistantship, City University of Hong Kong, Hong Kong SAR	2021 - 2023
Innovation Scholarship, Northeast Electric Power University, China	2017 - 2019
Excellent Student Scholarship, Northeast Electric Power University, China	2016 - 2020

Mathematics and Physics Competition Awards

2019 Interdisciplinary Contest In Modeling, USA *Honorable Mention*	[Thesis (English)]	Apr 2019
2018 Mathematical Contest In Modeling, Jilin, China *First Prize*	[Thesis (Chinese)]	Aug 2018
2018 Interdisciplinary Contest In Modeling, USA *Successful Participant*	[Thesis (English)]	Apr 2018
2017 National English Competition for College Students, China *Third Prize*		May 2017
2015 National English Proficiency Competition for Secondary School Students, China *First Prize*		Dec 2015
The 32nd Chinese Physics Olympiad (CPhO), China *Third Prize*		Oct 2015
2015 National High School Math League, China *Second Prize*		Sept 2015

Sports Competition Awards

2022 Standard Chartered Hong Kong Marathon, Full Marathon	Feb 2023
2021 Hangzhou International Marathon, Half Marathon	Apr 2022
CityU Top 5 Runner, City University of Hong Kong, Hong Kong SAR *The 1st Place*	Oct 2021
2021 Standard Chartered Hong Kong Marathon, Half Marathon *Rank 318 / 6000* **(01:38:14)**	Oct 2021
2018 National Marathon Championships (Jilin City Station), Full Marathon	Jun 2018
2017 National Marathon Championships (Jilin City Station), Half Marathon *Rank 148 / 5000* **(01:47:36)**	Jun 2017
Outstanding Athlete, Northeast Electric Power University, China	May 2017
3000-meter Steeplechase, The 45th NEEPU Games, Northeast Electric Power University, China *The 7th Place*	May 2017

Leadership Awards

Vice Chairman, International Communication Association, Northeast Electric Power University, China	Jun 2019
Outstanding Student Leader Awards, Northeast Electric Power University, China	Oct 2018

Reviewer

Check from Web of Science

IEEE Transactions on Multimedia (T-MM)	2023
IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)	2023

IEEE Journal of Biomedical and Health Informatics (JBHI)	2020, 2023
IEEE Sensors Journal	2023
Analytical Methods	2023
Postharvest Biology and Technology	2022
Scientific Reports	2023, 2024
Energy Reports	2023

Membership

China Computer Federation (CCF)	Since 2017
Institute of Electrical and Electronics Engineers (IEEE)	Since 2019
IEEE Student Chapter/IEEE Eta Kappa Nu (IEEE-HKN), Boston University	Since 2023
Association for Computing Machinery (ACM)	Since 2019
Association for the Advancement of Artificial Intelligence (AAAI)	Since 2022
ACM Special Interest Group on Artificial Intelligence (SIGAI)	Since 2022
ACM Special Interest Group on Multimedia (SIGMM)	Since 2022
ACM Special Interest Group on Computer Graphics (SIGGRAPH)	Since 2023
ACM Special Interest Group on Security, Audit and Control (SIGSAC)	Since 2023
Association for Computational Linguistics (ACL)	Since 2023
American Association for the Advancement of Science (AAAS)	Since 2023
Linguistic Society of America (LSA)	Since 2023

Volunteer

IEEE Boston Section, Boston, MA, USA	2024

INVITED TALKS

1. *AI In the 2020s And Beyond* [Presentation] Sept 2023

Invited Talk at The Construction of the Management Disciplines (CoME), Tianjin University, Tianjin, China.

PROFESSIONAL SKILLS

Coding: Python, C/C++, Matlab, R, Mathematica, HTML

Library: TensorFlow, PyTorch, Scikit-learn, Hugging Face (Transformers, PEFT, Datasets, etc.), vLLM

Tools: Git, SVN, Unix Shell, Vim, Markdown, LaTeX, Docker, K8s

Hardware: Nvidia Jetson Nano (Ubuntu), Raspberry Pi (Raspbian OS), 80C52 Microcontroller (Embedded C)

Hobby: Photography, Hiking, Mountain Climbing, Soccer, Skateboarding, Cycling, Coding, Marathon, Cooking

REFERENCES

Prof. Shiqi Wang, Associate Professor

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Prof. Jinglei Lv, Senior Lecturer

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Prof. Yimin Hou, Full Professor and Vice Dean

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