Siyi Du

PhD Student

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EDUCATION

2023–on **Ph.D. in Electrical and Electronic Engineering**
Imperial College London (IC), London, UK | Supervisor: Dr. Chen Qin
• Receive a 3.5-year PhD Scholarship

2021–2023 **M.A.Sc. in Electrical and Computer Engineering**
University of British Columbia (UBC), Vancouver, BC, Canada | Supervisor: Prof. Rafeef Garbi
• Thesis: Deep Learning for Dermatology : Contributions in Model Fairness, Multi-domain Adaptation, and Light-weight Efficiency | GPA: 94%
• Receive a Graduate Research Assistantship

2017–2021 **B.E. in Automation Science (Patten Recognition direction)** | Supervisor: Prof. Zengchang Qin
Beihang University, Beijing, China
• GPA: 3.83/4.0 (Ranking: Top 5)

WORK & RESEARCH EXPERIENCE

2023–2023 **Lenovo**
Summer Research Intern (Jul-Sep), Beijing, China
• Designed a novel visual-aware large language model (LLM) for sequential recommendation.
• Devised a multi-task pre-training strategy to learn visual features that include user preference and are understandable to LLMs and a instruction tuning method for parameter-efficient fine-tuning.
• Deployed the algorithm on Llama (a kind of LLMs) and trained it using the Amazon Product dataset.
• Wrote and published a patent in China.

2021–2023 **Biomedical Signal and Image Computing Laboratory, University of British Columbia**
Graduate Research Assistant, Vancouver, BC, Canada
• Conducted a detailed study on skin-type unfairness in skin lesion classification and proposed a novel classification model based on disentangled contrastive learning (accepted by ECCVW 2020).
• Developed a multi-domain vision transformer to mitigate model data-hunger in skin lesion segmentation, featuring domain adapters to combat negative knowledge transfer and mutual knowledge distillation to enhance representation learning (accepted by MICCAI 2023).
• Designed a new skin lesion segmentation algorithm based on parameter-efficient fine-tuning to further alleviate data-hunger and improve efficiency (accpeted by MICCAIW 2023).

2020–2022 **ICMLL, Beihang University**
Undergraduate Research Assistant, Beijing, China
• Proposed a novel model using graph neural network (GNN) to bridge the cross-modal gap in fine granularity for the visual dialogue task (accepted by ACM MM 2020).
• Introduced a new framework for the visual dialogue task, which uses a cost-sensitive loss to mitigate data bias and enforces the model to utilize both vision and language information (batchelor thesis).

2020–2020 **Cognitive Robotics and AI Lab, Kent State university**
Summer Research Intern (Mar-Oct), Kent, US
• Designed a novel encoder based on self-supervised learning to capture the high dimensional representation of objects' features related to similar physics laws in both old and new environments.
• Devised a policy decision module to generate action sequences based on representations extracted by the encoder. Implemented the whole model using Python and PyTorch.

SELECTED PUBLICATIONS

2024 TIP: Tabular-image pre-training for multimodal classification with incomplete data
Du, S., Zheng, S., Wang, Y., Bai, W., O'Regan, D. P., and Qin, C.. *European Conference on Computer Vision (ECCV)*.

2024 CAR: Contrast-agnostic deformable medical image registration with contrast-invariant latent regularization
Wang, Y., **Du, S.**, Zheng, S., Luo, X., and Qin, C.. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) WBIR Workshop*.

2024 SGSR: Structure-guided multi-contrast MRI super-resolution via spatio-frequency co-query attention
Zheng, S., Wang, Y., **Du, S.**, and Qin, C.. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) MLMI Workshop*.

2023 MDViT: Multi-domain vision transformer for small medical image segmentation datasets
Du, S., Bayasi, N., Hamarneh, G., and Garbi, R.. *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*.

2023 AViT: Adapting vision transformers for small skin lesion segmentation datasets
Du, S., Bayasi, N., Hamarneh, G., and Garbi, R.. *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) ISIC Workshop*. **[Best Paper Award]**

2023 Continual-GEN: Continual group ensembling for domain-agnostic skin lesion classification
Bayasi, N., **Du, S.**, Hamarneh, G., and Garbi, R.. *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) ISIC Workshop*. **[Oral]**

2022 FairDisCo: Fairer AI in dermatology via disentanglement contrastive learning
Du, S., Hers, B., Bayasi, N., Hamarneh, G., and Garbi, R.. *European Conference on Computer Vision (ECCV) ISIC Workshop*. **[Best Paper Award]**

2020 KBGN: Knowledge-bridge graph network for adaptive vision-text reasoning in visual dialogue
Jiang, X., **Du, S.**, Qin, Z., Sun, Y., and Yu, J.. *28th ACM International Conference on Multimedia (ACM MM)*. **[Oral]**

HONORS & AWARDS

2023 **Best Paper Award**, 8th ISIC Skin Image Analysis Workshop @MICCAI Conference

2023–2027 **3.5-year PhD Scholarship**, IC, UK

2023 **Graduate Support Initiative (GSI) Award**, UBC, Canada

2022 **Best Paper Award**, 7th ISIC Skin Image Analysis Workshop @ECCV Conference

2021–2023 **Research Assistant Scholarship**, UBC, Canada

2021–2023 **International Tuition Award**, UBC, Canada

2020 **Meritorious Winner**, Mathematical Contest in Modeling in USA

2018 **1st Prize**, National Mathematics Competition for College Students, China

2018–2020 **National Encouragement Scholarship**, Ministry of Education of the People's Republic of China

2018–2019 **Outstanding Student Award**, Beihang University, China

2018–2029 **Scholarship for Academic Competition**, Beihang University, China

OTHER ACTIVITIES

2024 **Reviewer**, MICCAI Conference

2024 **Teaching Assistant**, Computer Vision and Pattern Recognition Course, IC, UK

2023–2024 **Program Committee & Reviewer**, ISIC Skin Image Analysis Workshop @MICCAI Conference

2022–2023 **Teaching Assistant**, Medical Image Course, UBC, Canada

2018–2019 **Teaching Assistant**, Engineering Graphics, Beihang University, China

TECHNICAL SKILLS

Machine Learning
- Pytorch
- Tensorflow
- Scikit-learn

Software Programming
- Python
- MATLAB
- C

Hardware Programming
- SolidWorks
- AutoCAD
- Verilog HDL