Zijiao **Yang**

PhD Student · Computer Science Program

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Education

Oregon State University *Corvallis, USA*

PhD Computer Science *Sept. 2020 - present*

- Advisor: Dr. Stefan Lee
- GPA: 3.9/4.0
- Selected coursel list: Hign Performance Computer Architecture, Natural Language Processing with Deep Learning, Intro to Parallel Programming

University of Colorado Boulder *Boulder, USA*

MS Computer Science *Aug. 2018 - May. 2020*

- Advisor: Dr. James H. Martin
- GPA: 3.91/4.0
- Selected course list: Computational Lexical Semantics, Machine Learning, Convex Optimization, Bio-inspired Multi-Agent System, Statistical Data Analysis

Ritsumeikan University *Kusatsu, Japan*

BE Information Science *Sept. 2014 - July 2016*

- undergrad research advisor: Dr. Eric W. Cooper
- GPA: 4.3/5.0

Dalian University of Technology *Dalian, China*

BE Software Engineering *Sept. 2012 - Aug. 2016*

Publications

Published

Zijiao Yang, Arjun Majumdar, Stefan Lee. Behavioral Analysis of Vision-and-Language Navigation Agents. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023 (25%)

Research Experience

Conference Paper: Behavioral Analysis of Vision-and-Language Navigation Agents *Corvallis, USA*

Supervisor: Dr. Stefan Lee; Co-worker: Arjun Majumdar *Mar. 2022 - Oct. 2022*

- Formulated an intervention-based paradigm for analyzing VLN agents, identifying competencies and biases.
- Conducted case studies on three VLN agents, leading to the proposal of skill-specific competency scores.
- Investigated the correlation between skill-specific metrics and overall VLN task performance.

Project: Generating Navigation Natural Language Instructions. *Corvallis, USA*

Supervisor: Dr. Stefan Lee; Co-worker: Arjun Majumdar *Sept. 2021 - Feb. 2022*

- Evaluated various VLN instruction generation models, training a Prevalent-Speaker model that leverages pre-training on vision-language models (e.g., Prevalent, LXMERT).
- Devise different model architectures and achieve a reasonable qualitative result compared to previous speaker models. Conduct qualitative analysis on resulted models.

Project: Data Augmentation for VLN Agent Training with Templated Instructions. *Corvallis, USA*

Supervisor: Dr. Stefan Lee *June. 2021 - Sept. 2021*

- Developed templated instructions for R2R and RxR datasets, performing linguistic analyses to enhance data augmentation methods.
- Enhanced the Recurrent-VLN-BERT accommodating RxR's path property, explored reward shaping to obtain a SR of 47.5% for English-only val-unseen setting, reaching near 2nd place's performance on RxR Challenge Leaderboard (at the time), achieved without using external data source or adding special model design.
- Applied adversarial discriminative domain adaptation to bridge linguistic disparities between datasets, augmenting VLN training efficacy.

Project: Consistent Intent and Action Generation for Subject in a Scene. *Corvallis, USA*

Supervisor: Dr. Stefan Lee *July. 2020 - May. 2021*

- Investigated subject intentions and actions in visual scenes, training a multimodal GPT2 for consistent intent-action generation.
- Implemented a novel training instance weighting mechanism using a natural language inference model to ensure intent-action consistency.
- Designed and executed a human evaluation task using Amazon Mechanical Turk to validate model effectiveness.

Professional Experience

2020-2023 **Graduate Research Assistant**, EECS dept., Oregon State University

Awards

2020 **Lloyd Botway Fellowship**, University of Colorado Boulder

2015 **Special Encouragement Scholarship**, Ritsumeikan University *Full tuition waiver*

Academic Service

Peer Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2023
Neural Information Processing System (NeurIPS), 2021-2023

Skills

Programming Languages
Python, C, MATLAB, Ruby, R

Machine Learning
PyTorch, Pandas, Wandb

3D Mesh Processing
Pytorch3D

Languages
Chinese, English, Japanese