

# Zijiao Yang

PHD STUDENT · COMPUTER SCIENCE PROGRAM

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## Education

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### Oregon State University

Corvallis, USA

#### PHD COMPUTER SCIENCE

Sept. 2020 - present

- Advisor: Dr. Stefan Lee
- GPA: 3.9/4.0
- Selected course list: High 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

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### 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

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### 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**

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

**Awards**

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

2015 **Special Encouragement Scholarship**, Ritsumeikan University

*Full tuition waiver*

**Academic Service**

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**PEER REVIEWER**

IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2023

Neural Information Processing System (NeurIPS), 2021-2023

**Skills**

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**Programming Languages**

Python, C, MATLAB, Ruby, R

**Machine Learning**

PyTorch, Pandas, Wandb

**3D Mesh Processing**

Pytorch3D

**Languages**

Chinese, English, Japanese