# QIANQI YAN

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## EDUCATION

**University of Michigan** *Ann Arbor, U.S.*
B.S.E. (Major) Computer Science, (Minor) Mathematics *Aug. 2021 - May. 2023 (Expected)*

- GPA: 3.96/4.00
- Relevant Coursework: Natural Language Processing (A), Deep Learning for Computer Vision (A+), Machine Learning (A), Data Structure Algorithm (A), Computer Organization (A)

**Shanghai Jiao Tong University** *Shanghai, China*
B.S.E. Electrical and Computer Engineering *Aug. 2019 - May. 2023 (Expected)*

- GPA: 3.69/4.00

**Technische Universität Berlin** *Berlin, Germany*
Visiting Student *Jan. 2020 - Feb. 2020*

## RESEARCH EXPERIENCE

**Situated Language and Embodied Dialogue (SLED) Lab - University of Michigan** *Ann Arbor, U.S.*
Advisor: Joyce Chai *Jan. 2022 - Present*

- **Ground Language and Utilize Memory in Robotic Perception and Affordance**
  *Presented at the 2022 Microsoft Research Summit (Microsoft Turing Academic Program Workshop).*
  - **Objective** Leverage common sense in large language model (LLM) and incorporate episodic memory & multimodal model to enable embodied agent to outperform state-of-the-art baseline in goal localization and manipulation tasks in AI2-THOR environment.
  - **Responsibility** Design a prompting pipeline to query GPT-3 to generate actionable plans based on goal state and environment feedback. Collect 70k image-text pairs of egocentric view and goal state from the FILM dataset to fine-tune CLIP model to accurately match goal states with stored frames during inference.

- **Language-Aided Object Detection**
  - **Objective** Leverage common sense in LLM to improve performance of state-of-the-art object detectors on COCO, PASCAL datasets in a zero-shot manner.
  - **Responsibility** Develop a post-correction pipeline for object detectors to infer possible refinement of labels given scene description and spatial relation between bounding boxes.

**Stella Yu Group - University of Michigan** *Ann Arbor, U.S.*
Advisor: Stella Yu *Sep. 2022 - Present*

- **Hierarchical Semantic Segmentation**
  - **Objective** Build a vision model which conducts image-level recognition and semantic segmentation concurrently by matching hierarchy of image segmentation and language entity at each level of granularity.
  - **Responsibility** Extract 50k images from the CC12M dataset which contains hierarchical information in caption using Stanford CoreNLP parser. Introduce extra contrastive loss and fine-tune state-of-the-art model (GroupViT) based on the refined loss.

## WORK & TEACHING EXPERIENCE

**Initium AI - Machine Learning Software Engineer Internship** *Ann Arbor, U.S.*
Supervisor: Rada Mihalcea, Spencer Vagg *Apr. 2022 - Aug. 2022*

- Suggest and implement methods to improve quality of abstract summarization for dialogues, in particular, to address people references; and deploy pipeline to transcribe recorded sales conversations from audio to text.

**WIN. 2022 Intro to Computer Organization (EECS 370), Grader** *Ann Arbor, U.S.*
**SU. 2021 Intro to Circuits (VE 215), Teaching Assistant** *Shanghai, China*
**FA. 2020 Intro to Computers and Programming (VG 101), Teaching Assistant** *Shanghai, China*

- Design and grade course homework, course projects and exams. Hold recitation class and office hours.

## SELECTED PROJECTS

**Gender Debiasing in BERT Model** *Ann Arbor, U.S.*
Advisor: Lu Wang *Jan. 2022 - Apr. 2022*

- Implement two methods (INLP and GAN) to reduce gender bias in word tokens by appending an extra layer after word-embedding generation layer of BERT. Restore semantics by filtering out natural-gendered tokens during debiasing process.

**SLAM Map Construction and Path Planning based on UAV Vision** *Shanghai, China*
Advisor: Shiqun Li *Sep. 2019 - Oct. 2020*

- Design a service robot to be applied in hospital wards which is capable of navigating itself in unknown environment based on SLAM algorithm and provide customized message to patients according to locations in ward.

## RELEVANT SKILLS

**Programming Languages:** Python, C, C++, Java, JavaScript, SQL
**Software & Libraries:** Git, Bash, MATLAB, LaTeX, Mathematica, Verilog, Multisim, Origin
**Language Proficiency:** Chinese (native), English (proficient, TOEFL: 108)

## ACTIVITIES & AWARDS

**University Honors, Dec. 20. 2021** *Ann Arbor, U.S.*
**Dean's List, Dec. 31. 2021 & April 30. 2022** *Ann Arbor, U.S.*
**Silver Medal Winner, 2020 University Physics Competition** *Shanghai, China*
**Undergraduate Excellent Scholarship, 2020** *Shanghai, China*
**President, SJTU Student Union Sports & Club Department** *Shanghai, China*
**President, UM-SJTU JI Badminton Club** *Shanghai, China*