Building Generalizable and Inclusive Language Processing Models Across Tasks and User Groups

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Application Tasks

- Open-Domain QA
- Commonsense Reasoning
- Dialogue Generation
- ...
User Groups

Western Countries
User Groups

- Western Countries
- China
- India
- ...

Inclusive Across Regions
User Groups

Male
Female
Non-Binary Gender

Inclusive Across Genders
User Groups

Western Countries
- Open-Domain QA
- Commonsense Reasoning
- Dialogue Generation
- ...

China

India

NOT Geographically Inclusive
Research Interest

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Inclusive Across User Groups

- GD-VCR, EMNLP 2021, Oral
- GeoMLAMA, EMNLP 2022, Oral
- GIVL, Submitted to CVPR 2023
- GCI, NAACL 2021, Oral
- ENTIGEN, EMNLP 2022, Oral
Knowledge is actually geographically diverse!
Knowledge is actually geo-diverse!
White dress
Black suits
White flowers
White dress
Black suits
White flowers
...

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Evaluation Methods

Downstream Task Performance

- GD-VCR, EMNLP 2021, Oral
  - 10-20% gap on West and non-West Images

Knowledge Probing

- GeoMLAMA, EMNLP 2022, Oral
  - Only 30-40% probing accuracy, worse on non-West commonsense

- [MASK] -> white?
  - In traditional American weddings, the color of weddings dress is [MASK].

- [MASK] -> red?
  - In traditional Chinese weddings, the color of weddings dress is [MASK].
Improving Methods

Pre-Training

Vision-Language PLMs

Geo-Diverse Knowledge Image

Causal Inference

NLP Models + Learned Causal Graph

Murder

Text-to-Image Models

A photo of a doctor if all the people can become doctor irrespective of gender

GIVL, Submitted to CVPR 2023

SOTA and more balanced performance on geo-diverse V&L tasks with less data; Competitive on common V&L tasks

GCI, NAACL 2021, Oral

Better overall performance; More balanced performance on male and female cases

ENTIGEN, EMNLP 2022, Oral

More diverse outputs without losing quality
Research Interest

Building Generalizable and Inclusive Language Processing Models Across Tasks and User Groups

- Generalizable Across Tasks
  - Automatical and Dynamical Instruction Tuning, Ongoing

- Inclusive Across User Groups
  - GD-VCR, EMNLP 2021, Oral
  - ENTIGEN, EMNLP 2022, Oral
  - GeoMLAMA, EMNLP 2022, Oral
  - GCI, NAACL 2021, Oral
  - GIVL, Submitted to CVPR 2023
  - Low-Resource MT, Ongoing