CRL

Causal Representation Learning Reading Group: Overview and Introductions

12/01/21

The meeting will begin at 5 minutes past the hour

Agenda

Overview of topics and logistics

15 MIN

Introductions

30 MIN

Discussion and Suggestions

5 MIN

What is a Causal Representation?

- Part of our goal will be to develop opinions and answers to this question
- From “Towards Causal Representation Learning” (Scholkopf et al., 2021): A causal representation should ***“support intervention, planning and reasoning”***
- A potential definition: In a **causal representation**, the effects of actions on a system correspond to simple operations. For example, an action might be captured by (1) an intervention on a small number of variables, or, even more simply, by (2) a translation or other geometric operation.

Topics

- Identifiability of latent causal representations
- Related paradigms to Causal Representation Learning:
  - Object-centric learning
  - Learning disentangled representations
  - Representation learning for RL
- Advantages of causal representation learning
  - Domain generalization and domain adaptation
  - Sample efficiency
  - Interpretability
- …

Logistics

- We will meet once every two weeks for one hour. Meetings are on Wednesdays at 2pm EST, until further notice.
- We will use a Github repo (https://github.com/csquires/causal-rep-learning-reading-group) as our landing page. This has links to:
  - A Slack workspace (causal-representation.slack.com)
  - A schedule and a page for suggesting papers.
- Please sign up for presentation/discussant slots!
  - **Rule 1:** Authors are not allowed to present their own papers.
- Meetings will be recorded and saved in a Dropbox folder which is only accessible to reading group participants. Please email to opt out of being recorded.

Paper Presentations

- Aim for your presentation to be 30 minutes.
  - During the presentation, questions should be asked in the chat. A moderator (me) will read questions as they come up during the presentation, and we will aim to be done after 45 minutes, leaving 15 minutes for general discussion.
  - Reading group participants are expected to read each paper beforehand.
- Presentations should roughly adhere to the following outline:
  - **5-10 minutes**: Problem setup and contextualizing with respect to related work.
  - **10-15 minutes:** Spotlight difficult and/or novel conceptual and technical points.
  - **5-10 minutes:** Open questions, points of confusion, and directions for future work.

Introductions

- Name
- Current location
- Current institution and position, advisor(s)/collaborators
- Previous institutions/degrees
- Previous research topics
- What you're working on now

- Caltech
- CMU
- Columbia
- Facebook
- IBM
- Johns Hopkins
- Mila
- MIT
- Qualcomm
- ServiceNow
- Technion
- University of Amsterdam
- University of California, Berkeley
- University of Copenhagen
- University of Michigan

If your institution is not on the list, please send it in the chat

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