COIS 3270H

Thesis Paper - Rough Notes

Fall 2024

Dikshith Reddy Macherla

Student Id : 0789055

Bachelor Of Computer Science, Trent University

COIS 3270H - Philosophy Of AI

Professor : Michael Bruder

4th November, 2024

Thesis Paper - Rough Notes

- The frame problem deals with determining what information is relevant in a given situation for an artificial agent. It originated within logic-based AI, highlighting challenges in determining unchanged aspects of a state after an action (Wheeler, 2008, p. 325).
  - Importance: Without a solution, AI cannot function effectively in real-world, dynamic environments (Wheeler, 2008, p. 326).
- Wheeler's approach to solving the frame problem:
  - Importance: Without a solution, AI cannot function effectively in real-world, dynamic environments (Wheeler, 2008, p. 326).
  - Not via traditional cognitive science methods.
  - Draws on Heideggerian phenomenology (Wheeler, 2008, p. 328).
  - Introduces concepts of thrownness and situated interaction.
  - Divides frame problem into intra-context (action within a context) and inter-context (adapting to new contexts) (Wheeler, 2008, p. 330).
  - Intra-context frame problem solved by adaptive couplings; inter-context by continuous reciprocal causation (Wheeler, 2008, p. 331).
- Wheeler rejects traditional representational models of intelligence, suggesting instead that intelligent behavior can emerge from the interaction between agents and their environments (Wheeler, 2008, p. 333).
  - This challenges the traditional cognitivist approach.
- My argument extending Wheeler's position:
  - Reinforcement learning can partially address the frame problem by using experience-based policies rather than requiring exhaustive representation of each context (Sutton & Barto, 2018).
  - Reinforcement learning aligns with Wheeler's view of avoiding exhaustive representations, allowing agents to prioritize actions through experience.
  - Limitations: Reinforcement learning has issues with open-ended adaptability, unlike Wheeler's continuous reciprocal causation concept.

- ○ Hybrid framework: Combining Wheeler's embodied mechanisms with reinforcement learning could better tackle intra-context and inter-context frame problems.
- Wheeler's Heideggerian approach is compelling, emphasizing non-representational interaction. Adding reinforcement learning could enhance AI's adaptability.
  - ○ Embodied coping strategies + experiential learning = improved adaptability for real-world scenarios.