Collaborative Discussion 1: Agent Based Systems

by Maria Ingold

Summary Post

Wooldridge (2009) notes the key characteristic of an agent is its autonomy to achieve a set of goals. Hence the term "autonomous agent" in Maes (1991). Goals are attained through an agent's interaction in an environment by using sensors to receive information and actuators (effectors) to act (Maes, 1991; Russell & Norvig, 2021).

Wooldridge (2009) discusses "social ability" as one of the three components of intelligent agents, in addition to "reactivity" and "proactiveness". Lambert (2023a) compares this to humanity, arguing that social ability is not essential—a human is intelligent whether they are social or not. This an interesting philosophical debate—is someone or something intelligent if no one else knows or benefits from that intelligence—for instance if Stephen Hawking could not speak (Ingold, 2023)? As Lambert (2023c) further raises, who is measuring the intelligence and against what parameters? Like Star Trek, do we appear as naïve ants to multi-dimensional beings or as magicians to less advanced species? Ultimately, given multi-agent systems' need to communicate with each other and people to achieve goals I accept Wooldridge's (2009) assertion that agents have a social ability.

Maes (1991) explains that an "architecture" identifies the subcomponents that make up an agent and how the component modules interact. An agent stores an internal state and compares that to sensor data. The module interactions then specify the actions (via the actuator) and change internal state. Maes describes "Behaviour-Based AI" as providing distributed, decentralised behaviour where each module runs in parallel to gain a competence, cooperating with other modules so the entire "society" functions cohesively and correctly.

Lambert (2023c) raises an insightful debate about the "decline" of Intelligent Agents. My impression is that they are not being replaced, but evolving and complementing other technologies, such as Ratovondrahona et al. (2023) utilising virtual intelligent agents to create virtual developers which orchestrate pre-trained GPT3-based transformers to generate source code.

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