Peer response 1 - Nikolaos

Nikolaos argues against the notion that knowledge representation (KR) is a recent phenomenon tied to the advent of computing, highlighting its longstanding roots in human history. He points out that humans have always externalized knowledge beyond individual memory, exemplified by historical artifacts like Egyptian hieroglyphics, which he posits as an early sophisticated knowledge system. He also emphasizes the contributions of formal logic developed by philosophers such as Aristotle and Leibniz as precursors to computational KR (Brachman & Levesque, 2004). Nikolaos acknowledges that while formal study of KR in AI began in the mid-20th century, computing technology has augmented KR by enabling automated reasoning with systems like semantic networks and ontologies. He connects KR and reasoning, illustrating that KR structures information, allowing reasoning processes to draw inferences and make decisions (Lee, 2024).

While Nikolaos provides a robust historical context for KR, his argument could benefit from acknowledging the role of KR in facilitating human reasoning even prior to the computational era. For instance, not only did formal logic represent knowledge, but it also guided reasoning processes in mathematics and philosophy (Russell & Norvig, 2010). Furthermore, Nikolaos could enrich his analysis by considering examples of KR's utility without formal reasoning support, acknowledging that structured data systems serve critical roles in numerous fields, such as archiving and retrieval in libraries (Davis et al., 1992).

In conclusion, while the integration of reasoning amplifies KR's capabilities, as Nikolaos notes, the structured organization of knowledge has historically enabled both human and machine-interpretable insights, underscoring KR's enduring value. His insights align with the understanding that KR transcends its computational applications, rooted deeply in human efforts to encode and (re)utilize knowledge.

References:

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