

1. Motivation

- To develop socially intelligent agents capable of interacting in complex environments and with other agents, we need to create **embodied** and **biologically inspired agents** [1].
- Embodiment** is when agents are able to display states of facial expressions, postures and other gestures that appear during a social interaction [2].
- Biologically inspired** is when implementation of agent architecture takes inspiration from neuroscience and psychology. It enables these agents to adapt to realistic environments [1].

2. Objective

To **explore and systematically map** the diverse ways in which human-inspired social cognition has been integrated into embodied agents, and to understand the benefits of these integrations

3. Methodology

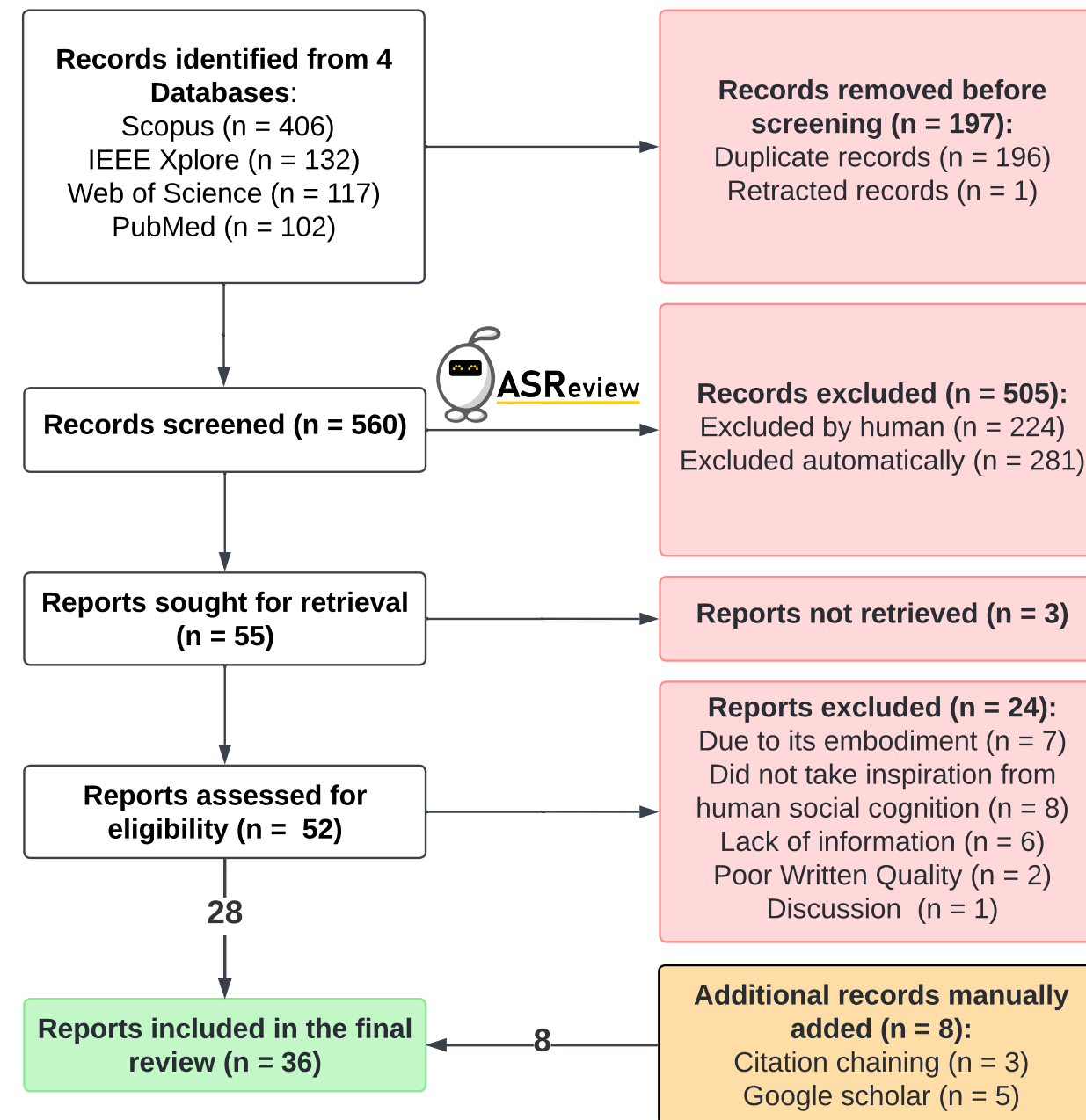


Figure 1: PRISMA Flow Diagram showing the number of papers in each step of the review process

- Systematic scoping review**
- Databases:** IEEE Xplore, Scopus, WebOfScience, PubMed

References

- [1] Samuele Bolotta and Guillaume Dumas. Social Neuro AI: Social Interaction as the "dark matter" of AI, April 2022. arXiv:2112.15459 [cs].
- [2] T. Ziemke, "What's that Thing Called Embodiment?" Proceedings of the Annual Meeting of the Cognitive Science Society, vol. 25, no. 25, 2003. [Online]. Available: <https://escholarship.org/uc/item/60w6v9j>

4. Results and Conclusions

- Various studies emphasised the importance of **mutual eye contact** and **gaze cue** in increasing **anthropomorphism** and **joint action coordination**.

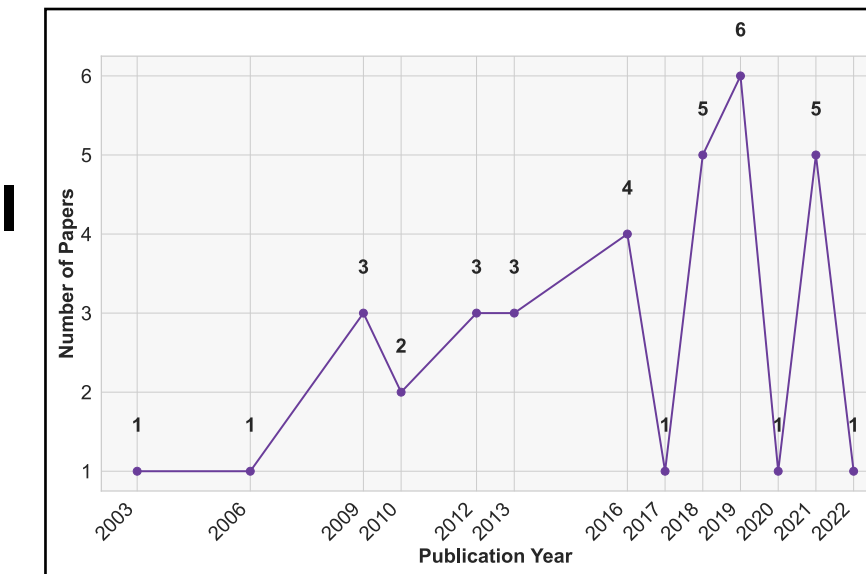


Figure 2: Included papers, categorised by publication year

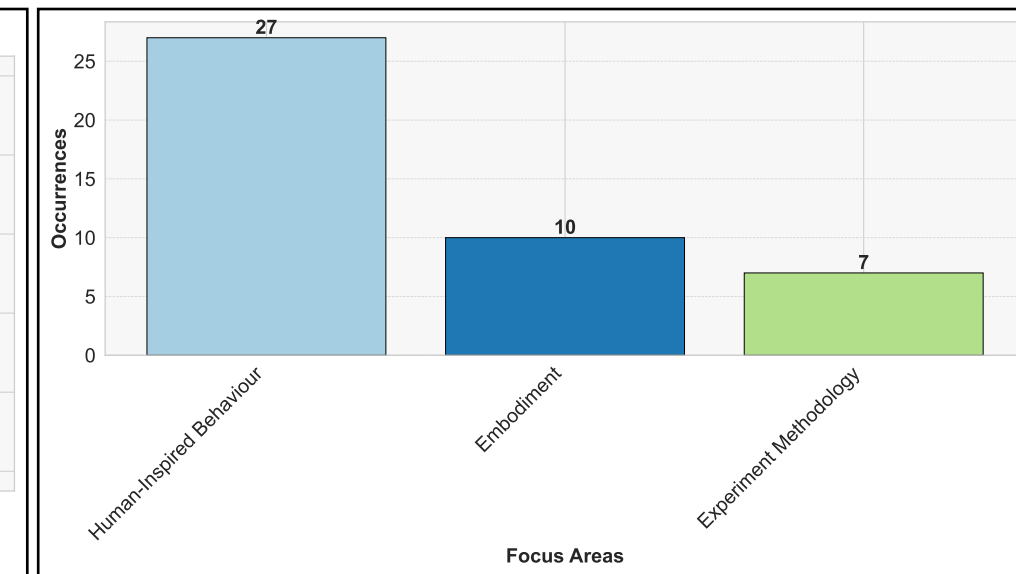


Figure 3: Included papers, categorised by high-level focus areas

- Inspiration was taken from **curiosity-driven, affordance-based to predictive learning** mechanisms, leading to **emergent behaviours**.
- Embodiment** offers a wide range of modes of communication to exchange information with social partners.
- Embodiment** can be manifested physically, virtually or a mix of both.

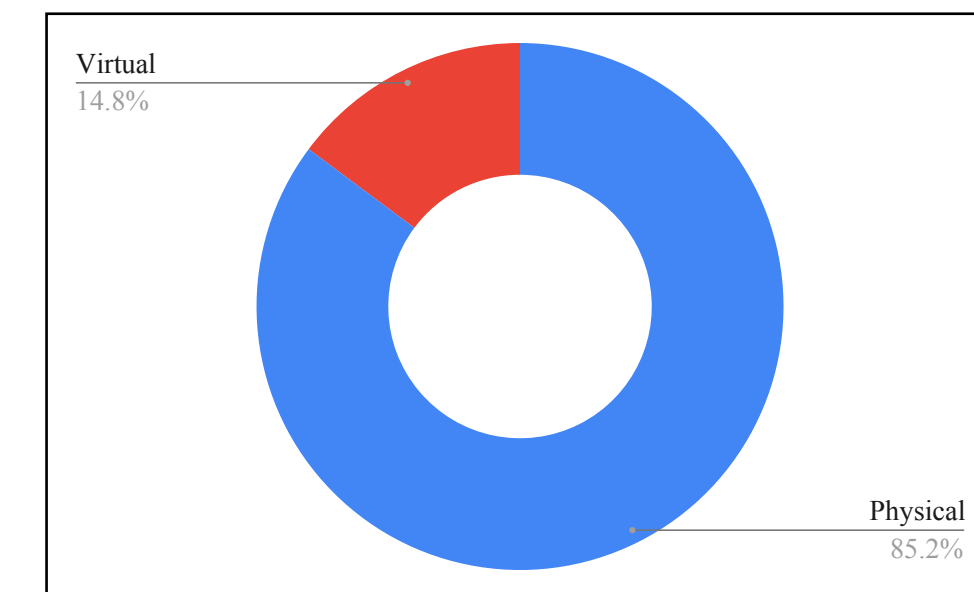


Figure 4: Included papers, categorised by type of embodiment

- Ecological validity** and **behavioural control** of embodied agents make them a crucial tool to study human behaviours. Insights from these can be used to adapt robot design accordingly.

5. Discussion and Limitation

- Most papers on human-inspired eye gaze, more focus should be placed on human mechanisms leading to emergent behaviours.
- The **optimal** choice of embodiment is *task-dependent*.
- Limitations:** Review process conducted by **one** author, *only a sample of the papers* were reviewed.