Symbols to Represent AI Systems

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Introduction

- AI is rapidly integrating in various domains causing communication and comprehension of these systems to be strained between users.
- A need to visual represent AI systems to open the “Black Box” phenomenon is becoming ever more present.
- These representations need to be generalizable to capture familiar and obscure AI systems while remaining understandable to all users.

Why Use Symbols?

- Breakdown complex frameworks
- Symbols have the potential to be universally understood. [1]
- Symbols have been used for a significant portion of human history. [2]
- Humans are good at learning and using symbols.

Future Work

- Develop a visual framework using semantic and composable glyphs (i.e., visual symbols) that will communicate AI systems
- Provide a real-world application of our framework using a use case.
- Evaluating out framework through expert opinion, user studies, and tool development.

References

[1] Joy Lo, Chih-Wei, Huey-Wen Yien, and I-Ping Chen. “How Universal Are Universal Symbols? An Estimation of Cross-Cultural Adoption of Universal Healthcare Symbols.” *HERD: Health Environments Research & Design Journal* 9, no. 3 (April 1, 2016): 116–34. https://doi.org/10.1177/1937586715616360.

[2] Sassoon, Rosemary, and Albertine Gaur. *Signs, Symbols and Icons: Pre-History to the Computer Age*. Intellect Books, 1997

[3] Hawkes, Teresa D., and Trevor J. Bihl. “Symbols to Represent AI Systems.” In *NAECON 2021-IEEE National Aerospace and Electronics Conference*, 61–68. IEEE, 2021.

[5] Bekkum, Michael van, Maaike de Boer, Frank van Harmelen, André Meyer-Vitali, and Annette ten Teije. “Modular Design Patterns for Hybrid Learning and Reasoning Systems: A Taxonomy, Patterns and Use Cases.” *Applied Intelligence* 51, no. 9 (2021): 6528–46.

Preliminary Work

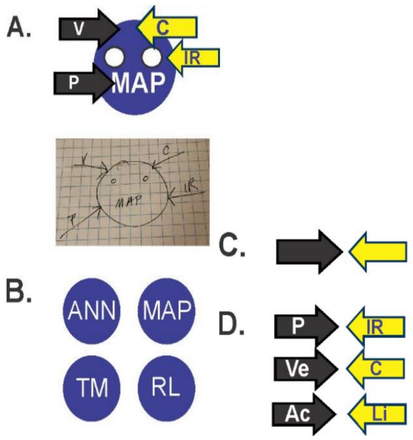

Figure 1. Applied AI Symbol examples [3].

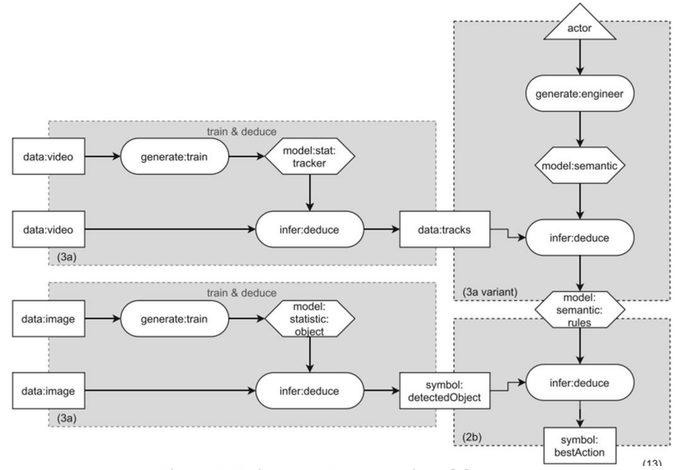

Figure 2. Robot Use Case Boxology [4].

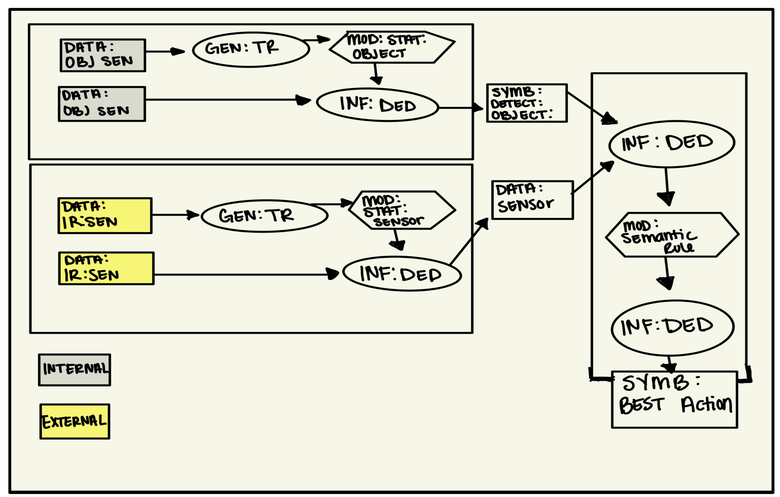

Figure 3. Combination of Roomba use case and Boxology

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