The Animal-AI Olympics

AI has made significant progress in recent years, reaching superhuman performance on a wide range of tasks. Humans are no longer the best Go players, quiz-show contestants, or even, in some respects, the best doctors. Yet state-of-the art AI cannot compete with simple animals at adapting to unexpected changes in the environment. This competition will pit our best AI approaches against the animal kingdom to determine if the great successes of AI are now ready to compete with the great successes of evolution at their own game.

Biological	VS	Artificial
✔	Intuitive Physics	⁇
✔	Object Permanence	⁇
✔	One-Shot Learning	⁇
✔	Intelligent Exploration	⁇
✔	Generalising to Novel Situations	⁇

✔ = Species Dependent
⁇ = Active Research Area

- **Prize pool TBC (looking for sponsors)**
- **Results will be presented at a major AI conference**
- **Top entrants invited to collaborate on competition paper**

Entering this competition will allow researchers to test their approach against, not only other AI researchers, but also the entire animal kingdom. Winning will require an AI system that can generalise to unseen cases. A perfect score will require a breakthrough in AI, well beyond current capabilities. However, even small successes will show that it is possible, not just to find useful patterns in data, but to extrapolate from these to an understanding of how the world works. Each entrant will be given an animal profile, determining which animals their performance most closely resembles.

Competition Goals

- **Benchmark current AI against multiple animal species** using a range of established animal cognition tasks
- Determine **which AI approaches are most promising** for these types of tasks.
- Create an **ongoing benchmark and data repository** for artificial cognition.
- Determine **which aspects of intelligence are challenging** for current AI and which AI already excels at.
- **Create new experiments** to feed back into the animal cognition community that can later be tested with animals.
- **Bring together two different disciplines** to share methods and developments.

Methodology

Experimental environments will be created in Project Malmo, Microsoft's AI experimentation platform built on top of Minecraft, and the specification of the building blocks for all tasks will be freely available to all participants of the competition. Participants are allowed to experiment as much as they like in preparation for the competition. The exact details of the competition tasks will be kept secret. Participant performance will be measured on a range of tasks from simple combinations of the building blocks to complex tasks designed to test for specific aspects of intelligence. Performance will be compared directly to animal performance across different species.

Images by Squidoodle
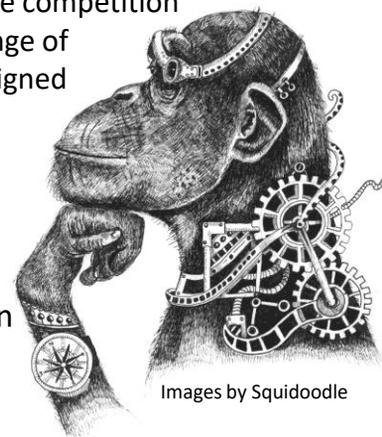
Timeline

- **November 2018:** Competition announcement and initial promotion
- **November 2018-June 2019:** Research, design and implementation
- **April 2019:** **Competition details released**
    - including specification of all building blocks
- **June 20th 2019:** Competition full release at Kinds of Intelligence: Machine Minds
- **May 2019 - October 2019:** Online **submissions open** at <u>CrowdAI</u> with regular progress updates and leaderboards
- **December 1st 2019:** (Provisional) **Deadline for final submission**
- **December 2019:** (Provisional) **Results announced** at NIPS 2019
- **2020 onwards**:
    - Results widely publicised and data made available
    - Testing platform made available to AI researchers to use for benchmarking
    - Results compared with animal data and large-scale analysis made
    - Task specifications made available to AI cognition community
    - Follow-up workshops in animal cognition and AI
    - Project to convert competition for outreach with schools
    - **Planning begins for future iterations** of the competition

Organising Committee

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Collaborators and Funders Sought