



Designing the Next ARC Challenge

AI models have demonstrated remarkable capabilities in recent years, but many areas remain challenging, especially those requiring advanced reasoning and abstraction. The Abstraction & Reasoning Corpus (ARC) <https://lab42.global/arc/> is one such challenge, testing the ability to deduce rules and patterns in visual tasks. Machine learning approaches currently achieve around 33% accuracy, whereas human performance is around 80%.

In this project, we plan to create a novel challenge in the spirit of ARC. The idea is to study abstraction in a more general setting, on graphs instead of grids. On grids, relationships between elements are almost always between directly adjacent cells, creating predictable and often repetitive patterns. By working with graphs, this benchmark encourages models to learn abstract reasoning that applies across varied structures and relationships. We will design a flexible problem language to represent abstractions on graphs, and implement a dataset of these tasks. Additionally, we will test existing ARC solutions on this dataset to evaluate how well current models generalize to more advanced reasoning tasks.

We will have weekly meetings to address questions together and discuss progress. Success in this project could set a new standard for AI reasoning benchmarks, and the goal is to submit to a top-tier conference.

Requirements

Very strong programming skills (Python, C / C++, etc.) and a good knowledge of machine learning. Familiarity with graphs is essential, experience using Graph Neural Networks is a plus.

Contact

Interested? Please reach out with a brief description of your motivation in the project, along with any relevant courses or prior projects (personal or academic) that demonstrate your background in the area.

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