LARC: Language annotated Abstraction and Reasoning Corpus

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Abstract

The Abstraction and Reasoning Challenge (ARC) is a set of tasks where one must induce a program from a few given input-output examples, and apply it to a new input. Although humans can easily solve most tasks, ARC is challenging for state-of-the-art algorithms. We hypothesize that humans use intuitive program induction, and interpret ARC tasks by constructing "natural programs" in language.

We experimentally study "natural programs" by formulating a two-player game: A participant solves and then communicates the program to another participant using natural language; the second participant must solve the task using the description alone. We find at least 361 out of 400 tasks can be solved from a natural language description, demonstrating that natural language is sufficient in transmitting these natural programs.

We compared the natural language programs to computer programs constructed using two separate state-of-the-art program synthesis approaches, and conducted a study on leveraging natural language annotations to improve performance of program-synthesis tools.