ETH
Eidgenössische Technische Hochschule Zürich
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Distributed Computing

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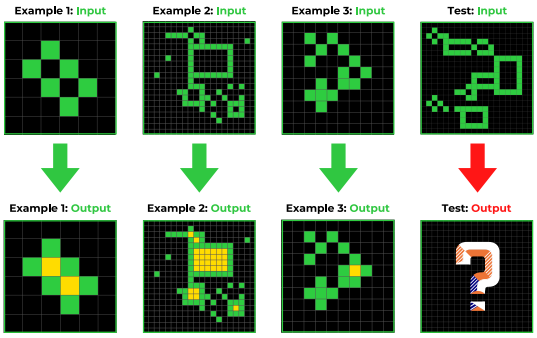
AlphaZero meets ARC

An open problem in AI is the Abstraction & Reasoning Corpus, ARC https://lab42.global/arc/, where current machine learning approaches can only get a score around 33% while a human can get a score of 80%.

In a world of Large Language Models, ARC is highly relevant, as it establishes a benchmark where humans (still) outperform machines. To solve ARC one must show that machines can learn to reason given only some visual context.

In this project, we want to tackle ARC using methods and models similar to AlphaZero and AlphaGeometry. This involves creating a language for the ARC problems and a large dataset of synthetic problems as for AlphaGeometry. We would then create instances of AlphaZero to demonstrate its ability to handle these problems.
This project is expected to be very difficult and you will be working with SoTA models on an unsolved problem. The goal of a successful project will be to submit to a top-tier conference.

The exact methodology used to solve the problem is not fixed, and we will work together to solve the problem.



Requirements: Very strong programming skills (Python, C / C++, etc.) and a good knowledge of machine learning. Previous experience working with RL is an advantage.
We will have weekly meetings to address questions together, discuss progress, and think about future ideas.

Contact

In a few short sentences, please tell us why you are interested in the project and about your coding and machine learning background (i.e., your own projects or relevant courses).

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- Benjamin Estermann: besterma@ethz.ch, ETZ G60.1