Path to Efficient AGI

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Contents

1 Introduction

This paper is the prelude of a series of papers that explore a new school of AI methodologies, which naturally incorporates with established AI methods like deep learning, and shall lead us towards **efficient** artificial general intelligence.

Here **efficiency** is the key because an inefficient AGI will take too long to appear or too expensive to be of important usage, although they could be helpful for entry level tasks. The meaning of efficiency is twofold:

(i) Statistical efficiency. The ability to learn accurately from limited examples.

(ii) Computational efficiency. The ability to perform computation in time and within resource boundary.

Remark. *Biological intelligence, especially that of human beings, border collies, huskies, etc, although being far more efficient than deep learning, is still far from perfection. We are already beaten by computer programs in terms of memorization or rule based computation. A prediction of this note is that, a near optimal AGI implementation over the architecture of CPUs and GPUs will be far superior than biological intelligence.*

This paper is the blueprint of how to achieve efficient AGI, including

(i)

(ii)

(iii)

It's going to be followed by

(i) a paper on a new programming language called Husky, which satisfies the langauge requirments proposed;

(ii) a paper on image classification based on ideas in section XX;

(iii) a paper on image generation based on ideas in section XX;

2 Related Works

3 Theories Based on Turing Machines

3.1 Conventions

For the matter of succinctness, we shall restrict ourselves to Turing machine level when thinking of computation. This is of course far from reality, but it helps with illuminating the high level ideas.

3.2 NP Problems Arising from ML Problems

We begin with the well-known fundamental (non-unique) conversion of an ML problem into an NP problem.

An ML problem is about finding a function $X \to Y$ such that

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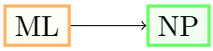

3.4 NP-ML Ascension