

RC Research Fellowship Proposal: OpenBrain

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1 Background

2 Goals

There are essentially four goals of the OpenBrain project.

- Build a massiveley parallel Beowulf cluster of parallela computers controlled using MPI on ArchLinux.
- Create an always online, turing complete modification to the recursive neural network algorithm whose fitness is determined by the Universal Intelligence Measure described in (Legg and Veness, 2011). The algorithm must have the following constraints:
 - In the spirit of John Conway’s turing complete Game of Life, the individual neural nodes must follow arbitrarily simple rules in a decentralized fashion.
 - *Training* is unsupervised and occurs over the lifetime of an *instance* of the open brain, such that the aforementioned governing rules are modified with respect to the fitness of the instance.
- Implement each neural node as an Erlang process distributed across the Beowulf cluster asynchronously.
- Provide always on input/output to the OpenBrain cluster in similar fashion to that done in Google DeepMind’s Deep Reinforcement Learning.

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