

Math 302 Project Proposal

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Topic

Creating a Neural Network Agent for Hex

We would like to explore the topic of making a neural network agent that is capable of playing the game board Hex. Hex agent has been thoroughly explored by the Hex research group at the University of Alberta. The most advanced model currently uses a combination of Monte Carlo Tree Search and a Deep Convolutional Neural Network to guide the search. Other methods for the agents include A/B pruning, Q-learning, etc. We wish to implement a simple neural network approach and compare them with the state of the art models as well as with human performance.

For the starter code, we will be adapting the human player dataset scraped from littegollem.net from a github repo referenced below. Our research is going to primarily focus on papers published by Gao Chao from the University of Alberta. We will be writing our code in python and utilizing the pytorch library for the purpose of making the neural network.

References

- **Starter code:** <https://github.com/hi4a4/Hex-AI>
- **Data:** <https://raw.githubusercontent.com/hi4a4/Hex-AI/master/finaldataframe.csv>
- https://webdocs.cs.ualberta.ca/~mmueller/ps/2020/Gao_Chao_202003_PhD.pdf
- <https://webdocs.cs.ualberta.ca/~hayward/papers/movepredhex.pdf>
- <https://webdocs.cs.ualberta.ca/~hayward/papers/transferable.pdf>
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