LeelaChessZero

Open Source Community
(F. Huizinga)

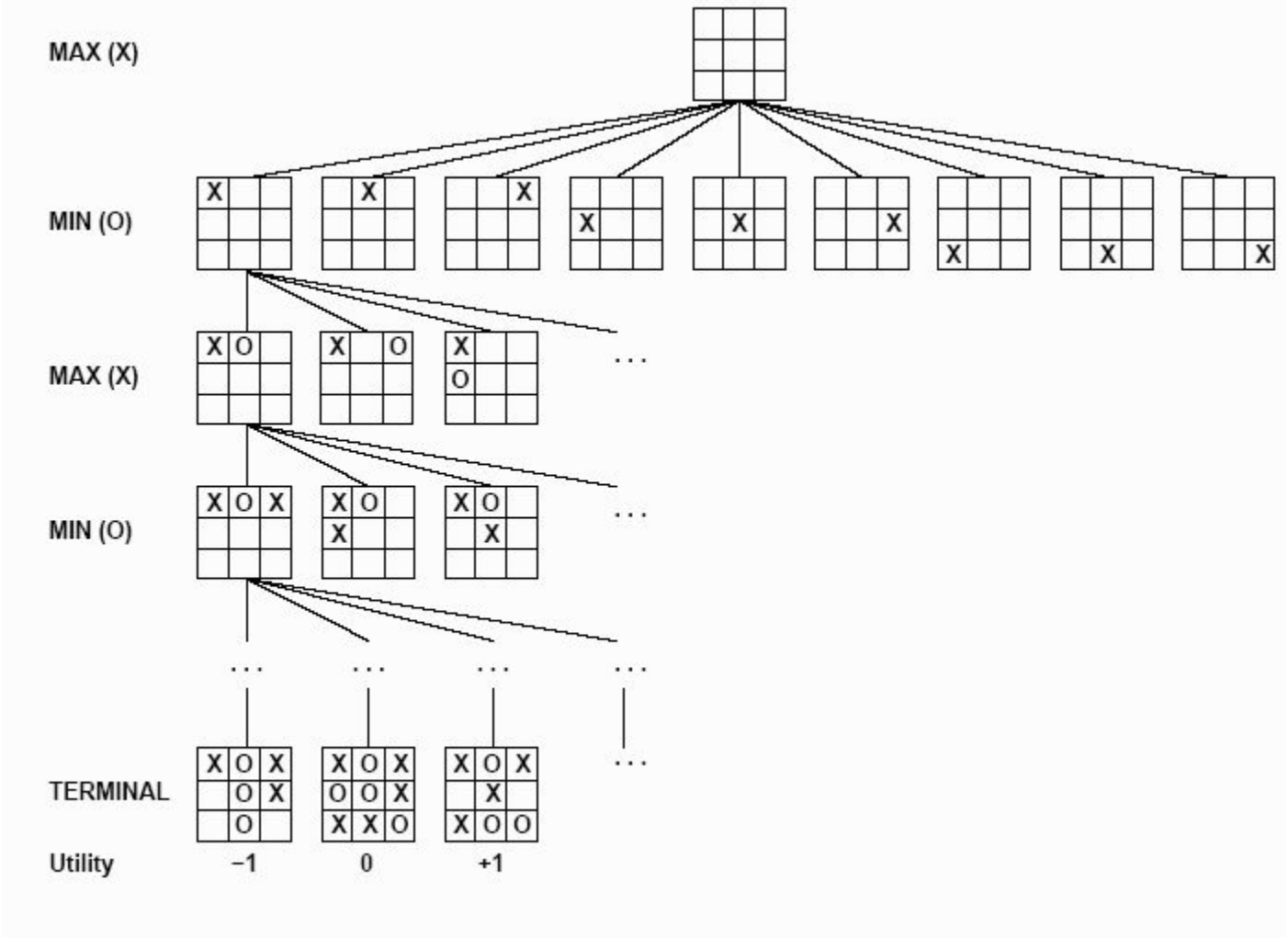
Overview

- What is Lc0?
- The GameTree and A0 in a nutshell
- Contribute
- Useful links
- Technical details

What is Lc0?

- 2016 Deepmind’s AlphaGo
- 2017 AlphaZero
- 2017 LeelaZero
- 2018 LeelaChessZero

The Game Tree



Why care?

- General approach, no domain knowledge required (Go, Chess, Shogi, …)
- Visual interpretation of the game allows for a deep positional - and materialistic understanding obtained from selfplay
- Fascinating gameplay, see youtube videos on alphazero/leelachesszero

LeelaChessZero

- Initially missing details on the neural network architecture
- Variable compute budget
- Obtain dedicated hardware for training
- Always looking for contributors
  - Developers
  - Computational help
  - Testers/Elo estimators
  - Enthusiasts

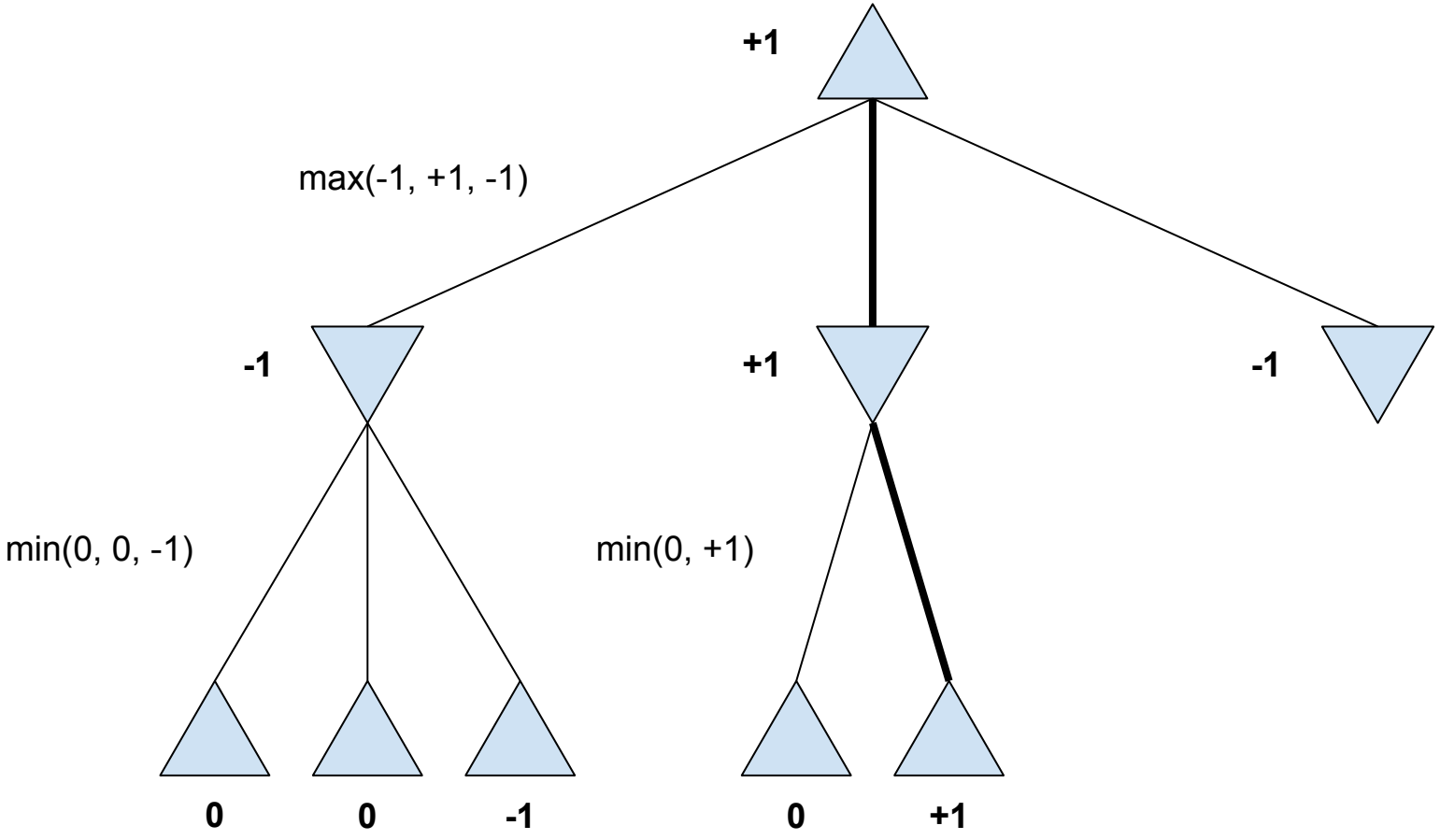
Links

- lczero.org
- testtraining.lczero.org
- github.com/LeelaChessZero
- discord.gg/pKujYxD

Thanks to

- DeepMind
- Gian-Carlo Pascutto
- Leela Developers
- Lc0 Developers
- Testers
- Chess enthusiasts

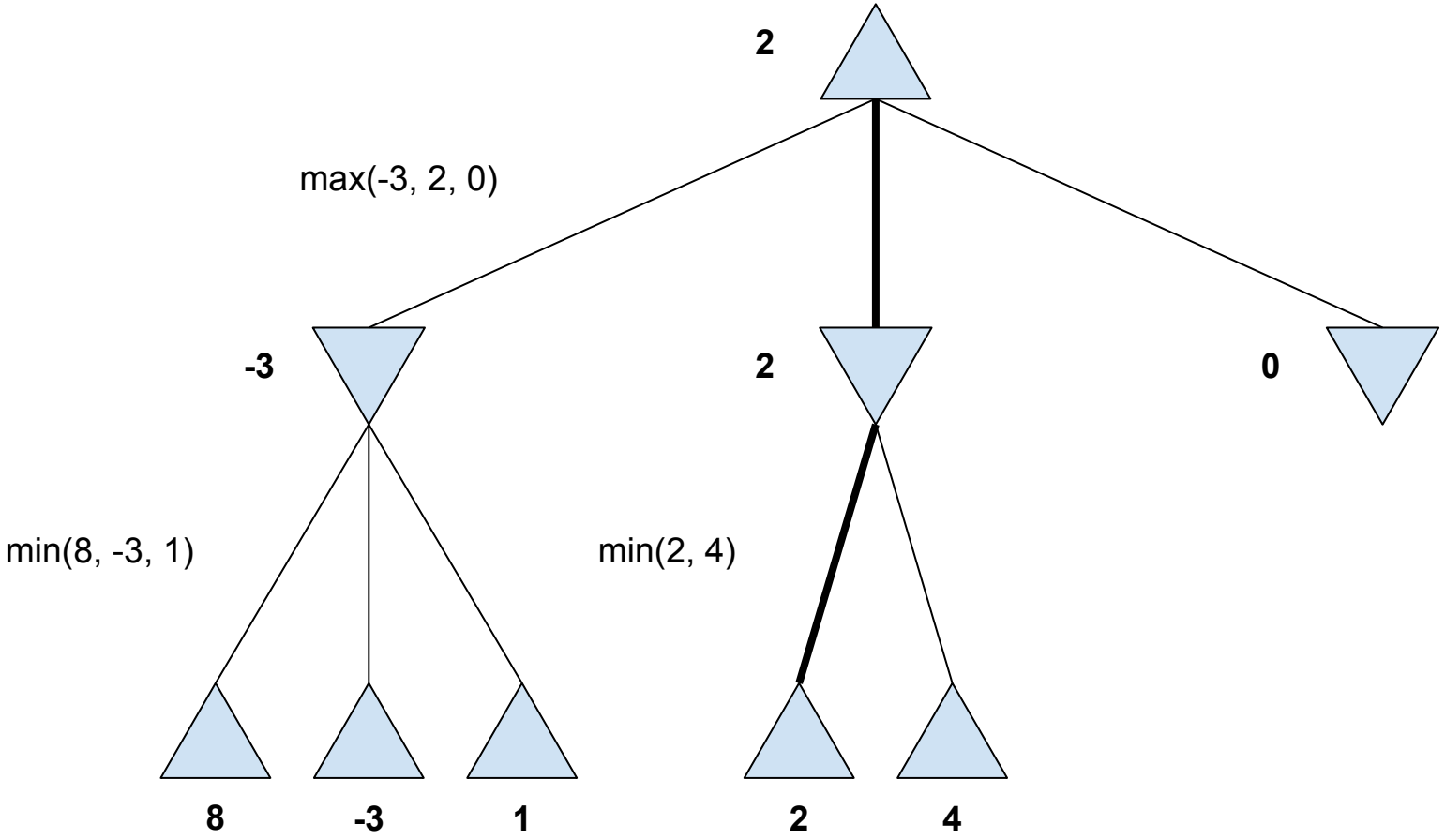
Minimax Algorithm



Evaluation Function

- Minimax unable to reach *terminal* nodes given time constraints
- Approximate minimax value of subtree
- Must evaluate *non-terminal* nodes
- Centuries of human chess understanding to properly define this function

Minimax + Eval

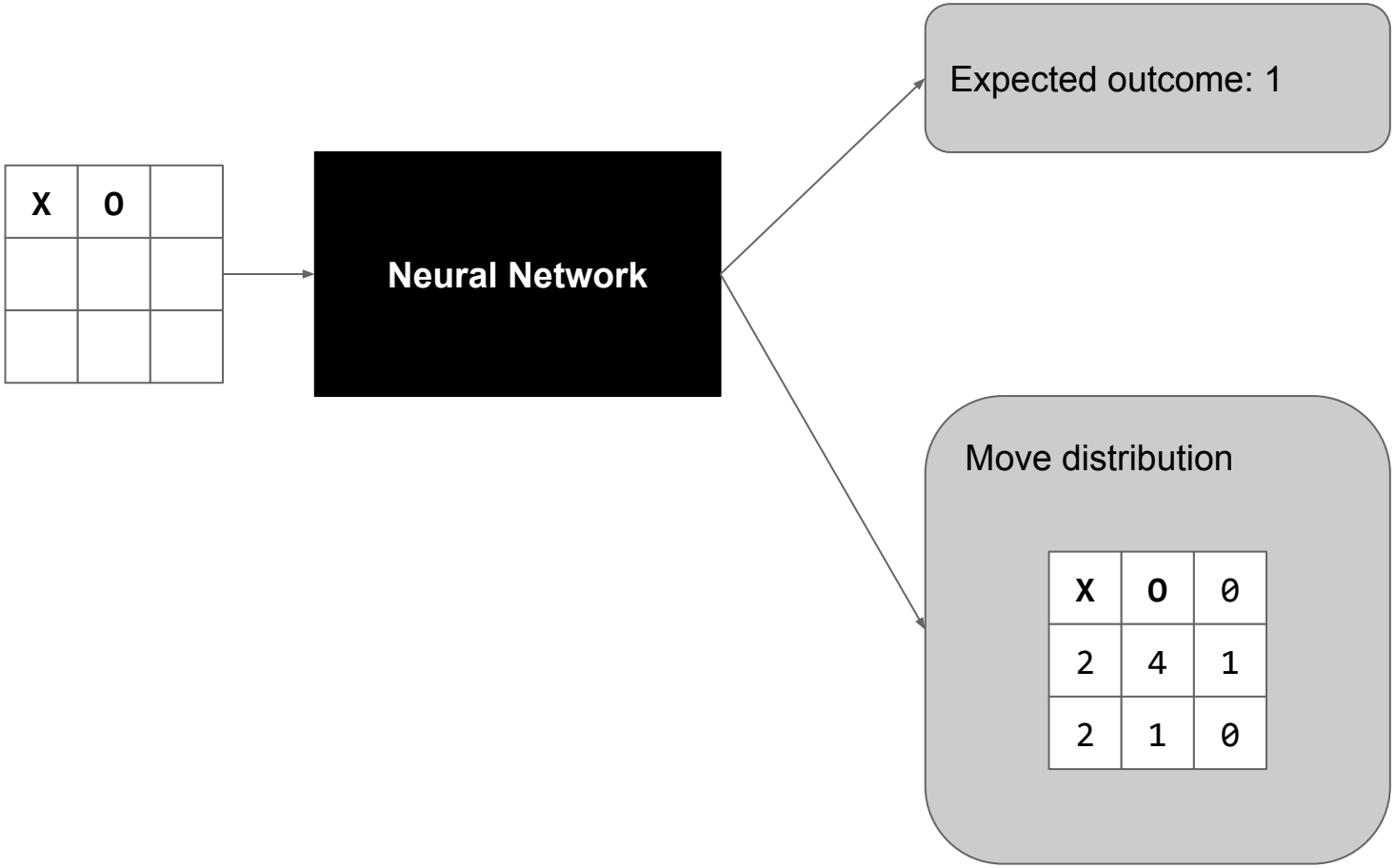


AlphaZero

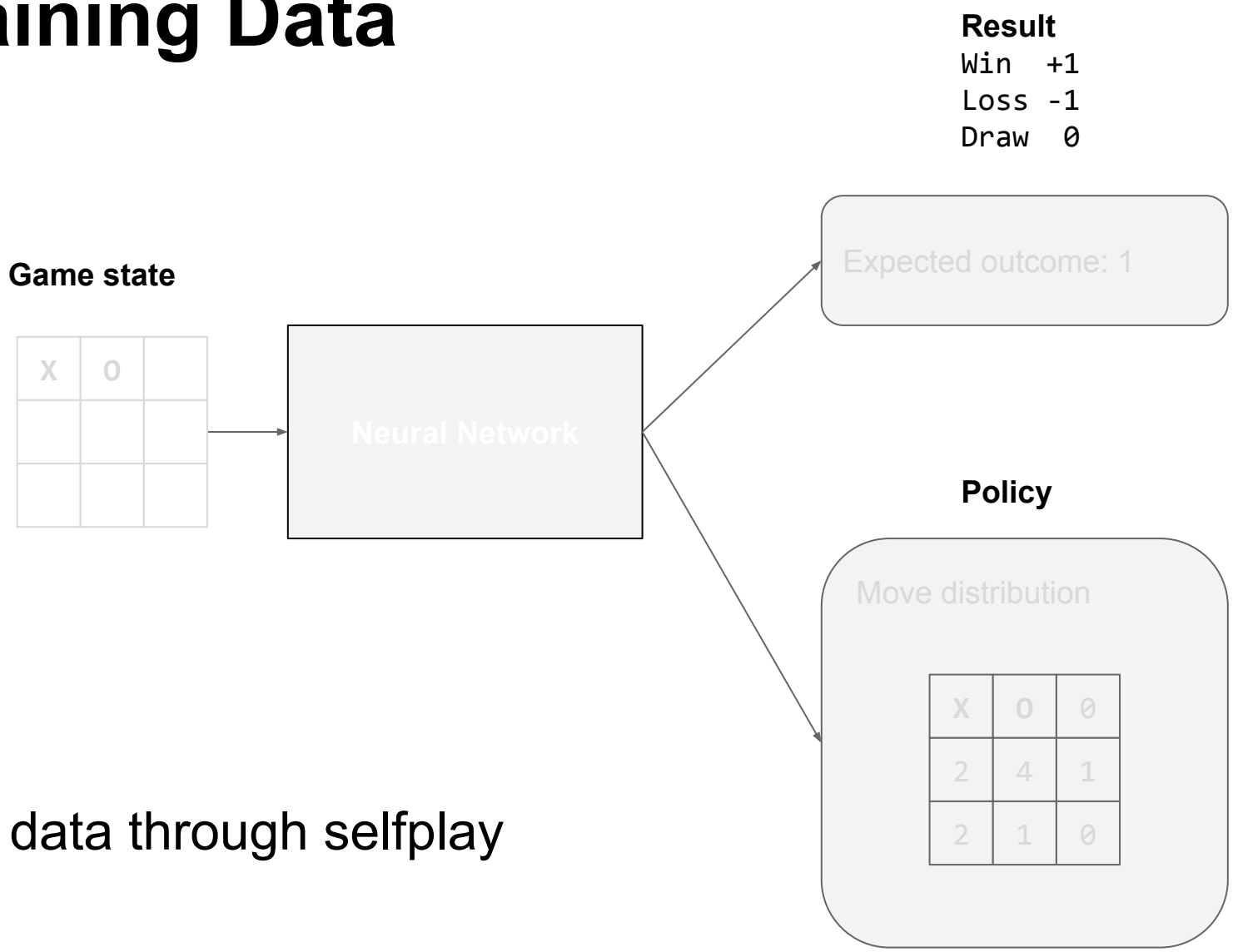
Main objective: Prune the gametree

Learn the **evaluation function** (value) and **most promising moves** (policy) of the gametree **iteratively** from selfplay data.

Neural Network

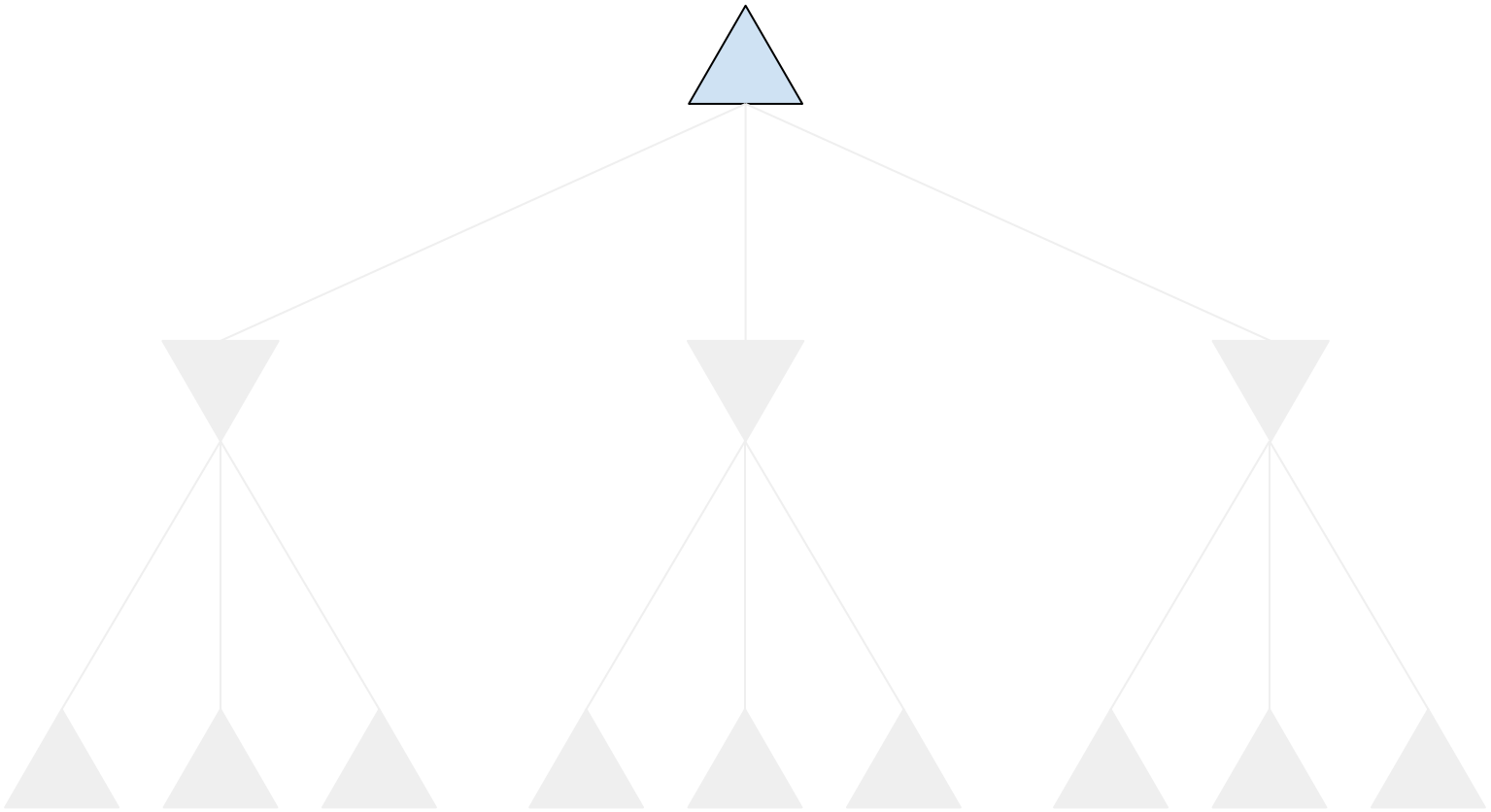


Training Data



Obtain data through selfplay

(MCT) Search



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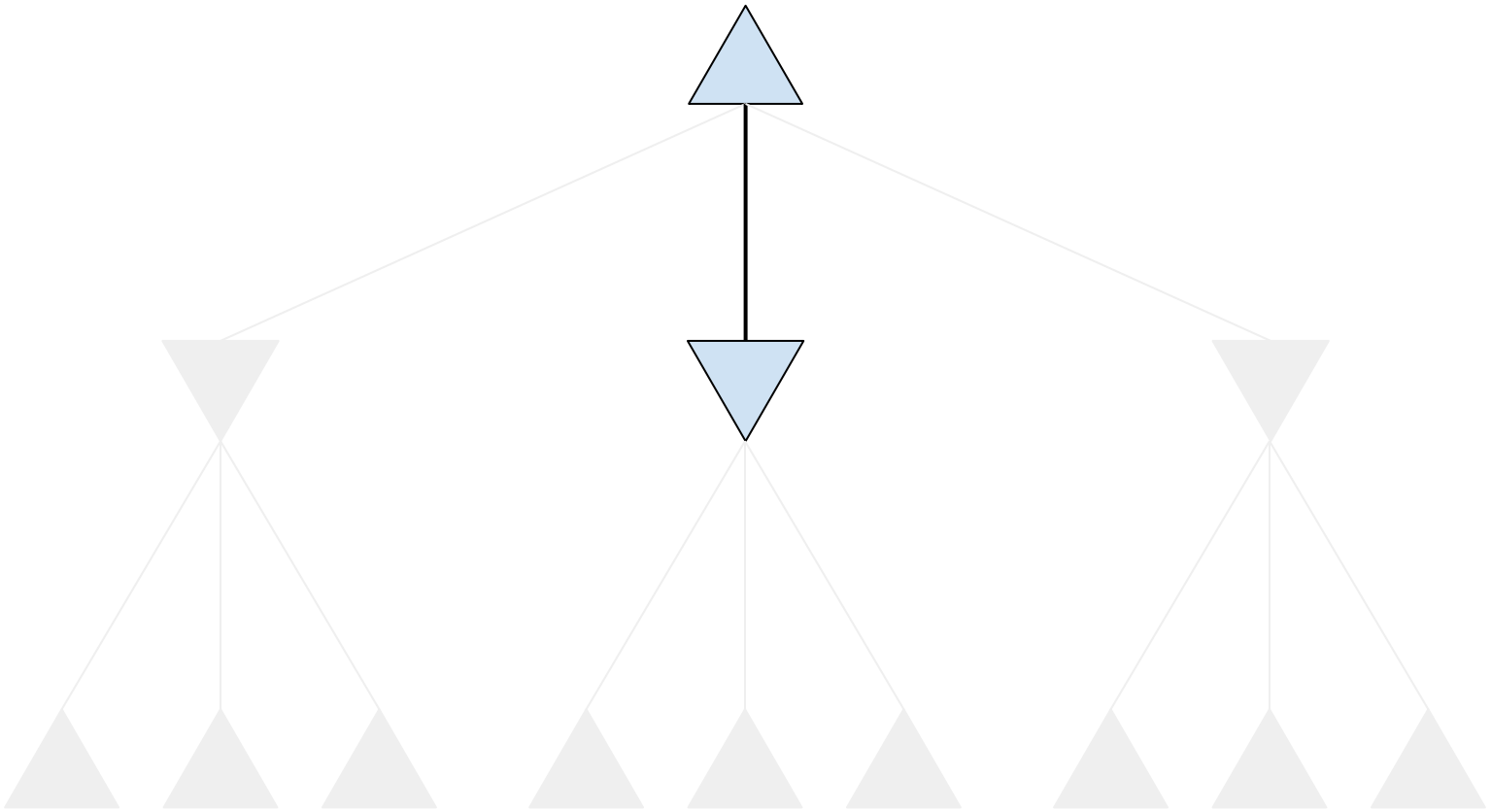

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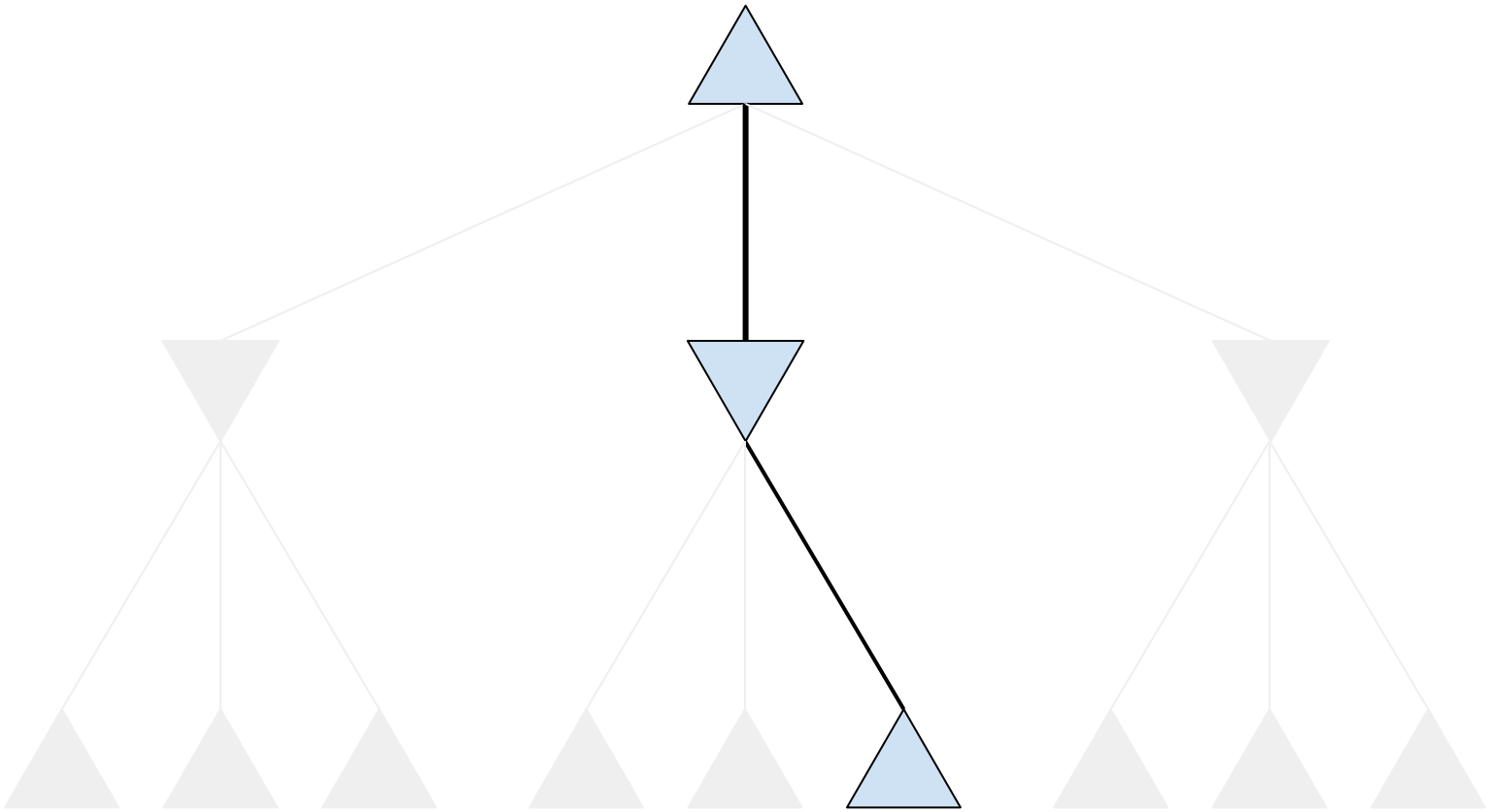

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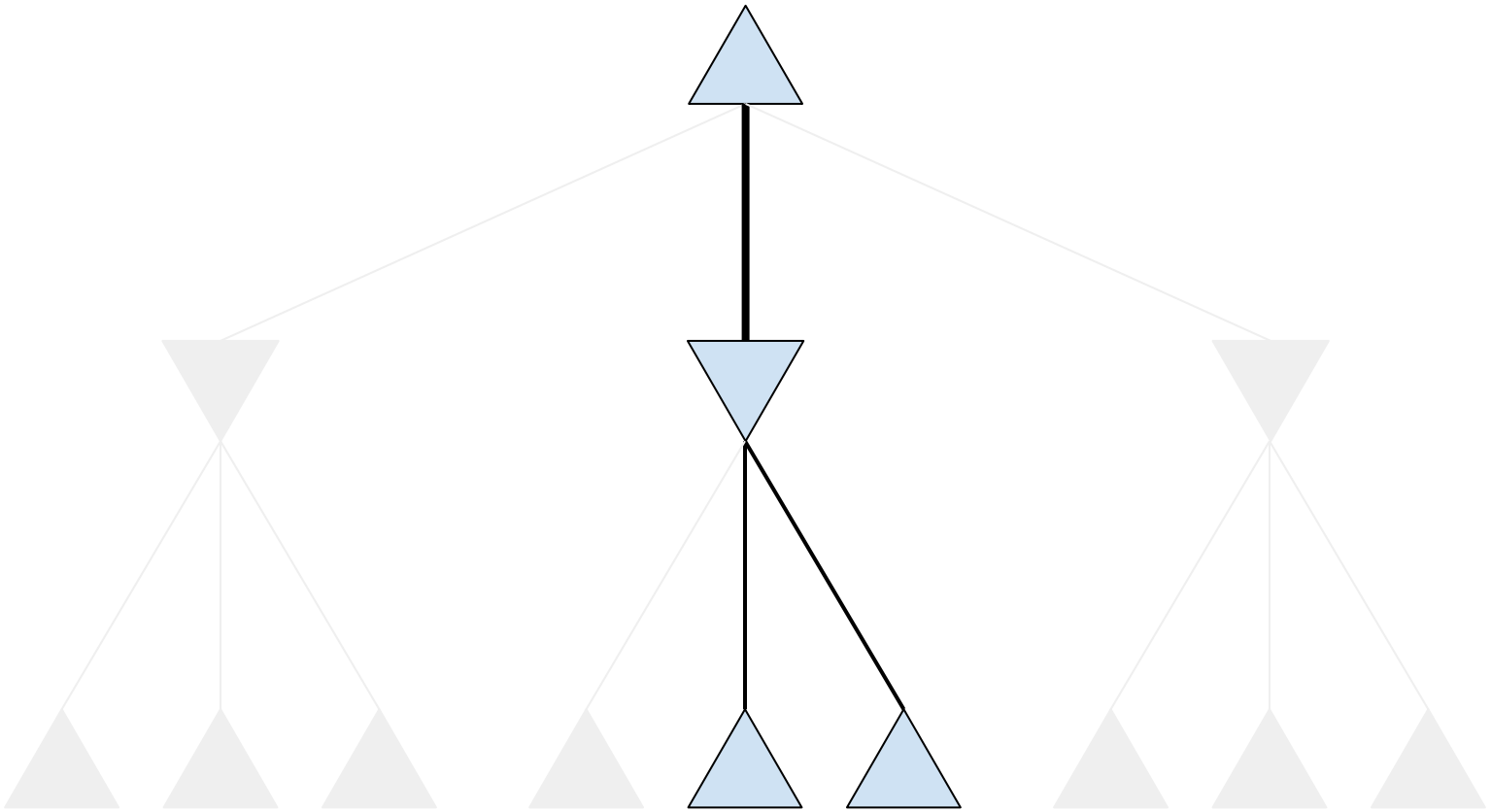

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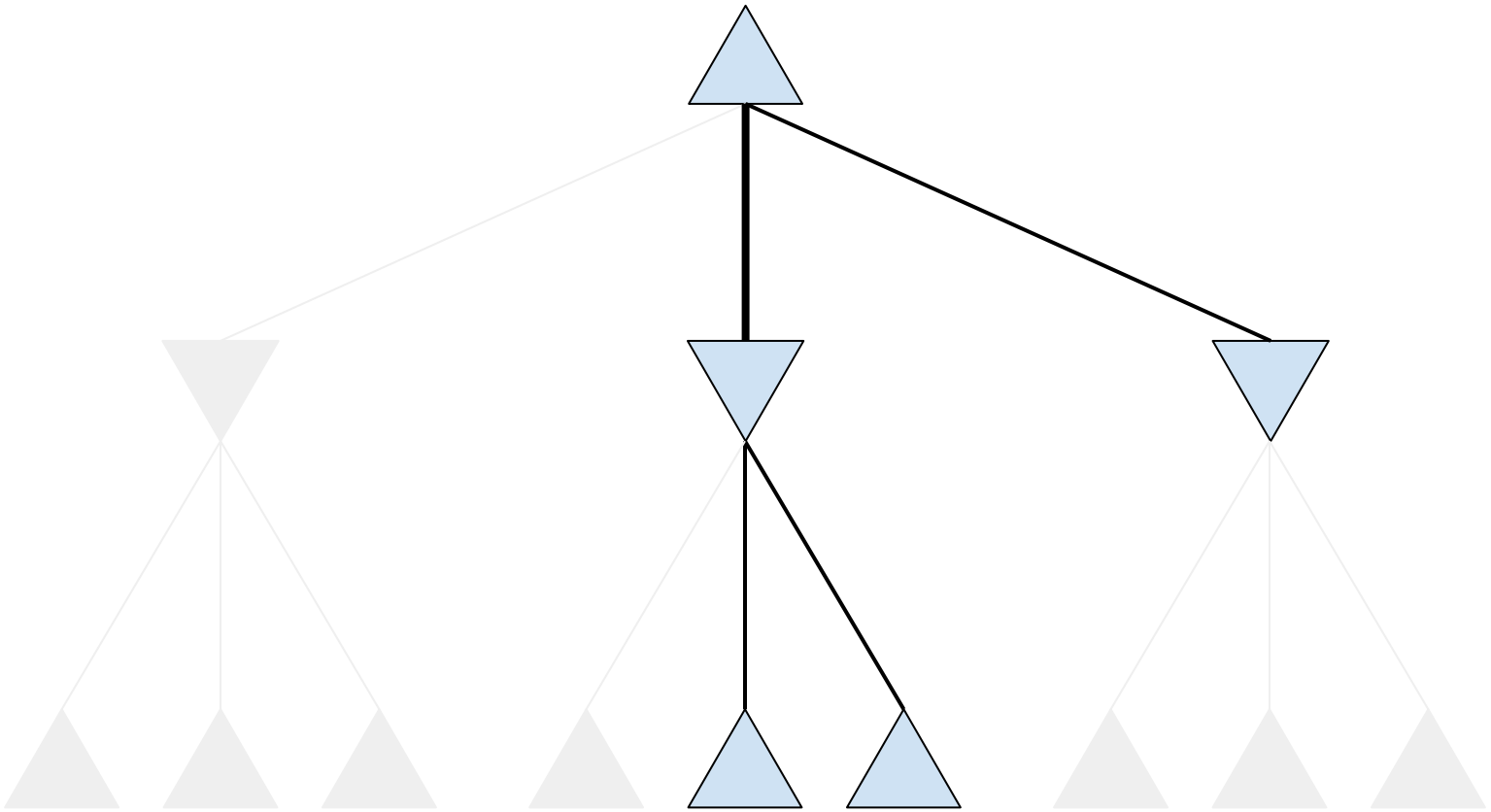

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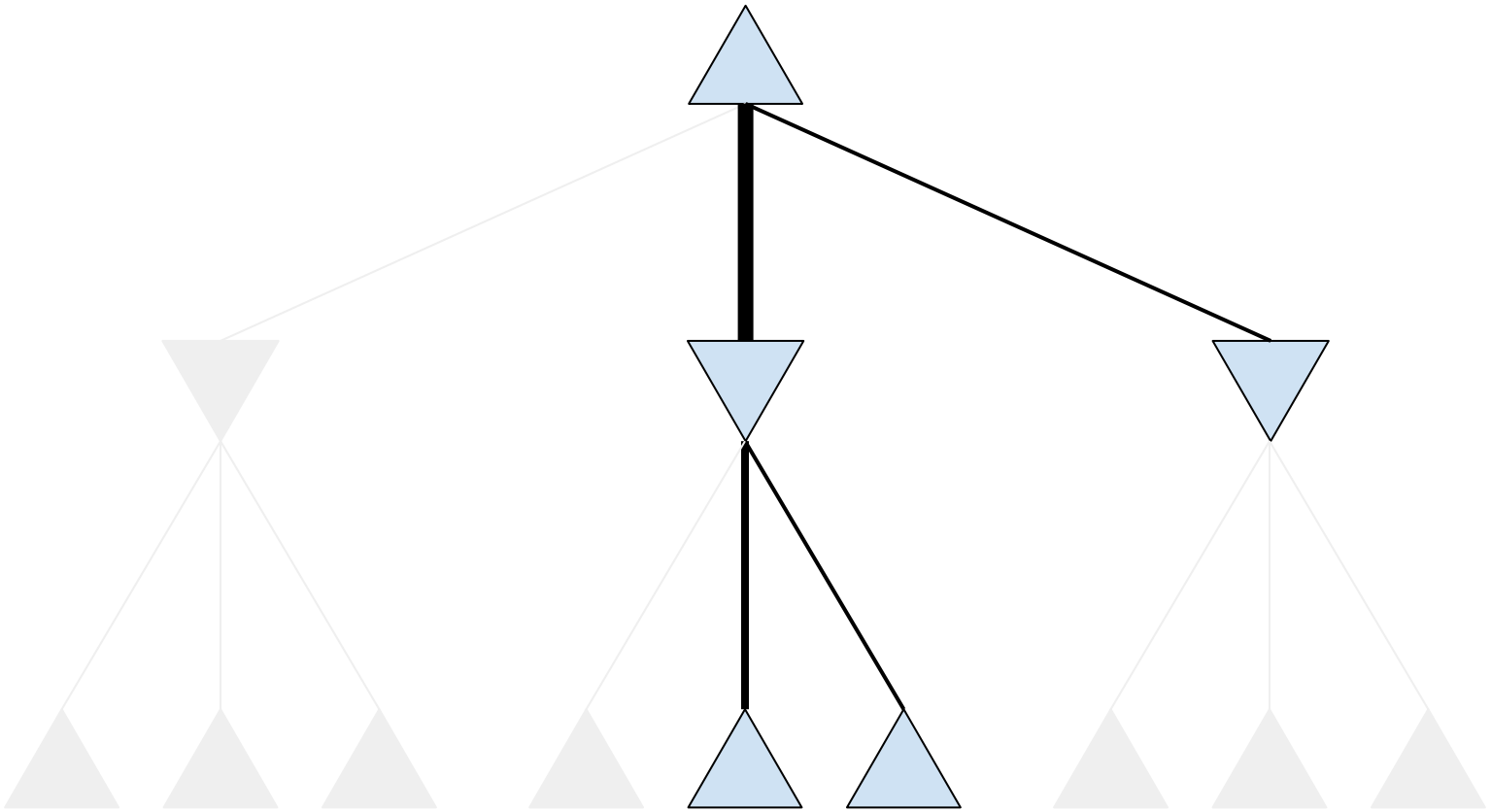

Records of data

$(State_1, Policy_1, Result_1)$
$(State_2, Policy_2, Result_2)$
...
$(State_n, Policy_n, Result_n)$

Where n is the total moves in the game played.