

Title: **Building an self-optimizing model for the Bloodbowl boardgame**

Supervisor : *Kurt Driessens*

Promotor: *Hendrik Blockeel*

Context

Bloodbowl has been described (by some of it's fans) as "Chess with dice". Although it doesn't have the prestige of chess (just look at the name of the game), it is a challenging boardgame with a large strategy component that could possibly become an interesting AI application. The game has a large branching factor, a stochastic element in that the outcome of some actions are influenced by the throw of a die, and might require a relational approach to analyse board positions and incorporate the large amount properties that are available to playing pieces .

Aim

The long term idea is to build an AI player for the game, but given the complexity of the game, this probably is a multi-year plan. However, one of the first steps in building this AI player, is the construction of a model of the game, that can later be used to search the set of all possible moves and determine the optimal one. Since the moves in Bloodbowl are non-deterministic, target board positions can often be reached in multiple ways, the model will have to include a search algorithm to look for optimal ways of reaching the intended boardposition. To keep this problem tractable, the work in this thesis will focus on moving single playing pieces.

The actual work in this projects will consist of the following steps:

1. Model the rules of the boardgame into a querable format.
2. Construct a search algorithm that searches for the optimal way for a board piece to reach a target square on the board.
3. Build a higher level model that lists all possible actions for a board piece together with all possible stochastical outcomes of those actions and their probabilities.

Because of the complexity of the game, prior experience with the Bloodbowl game will be beneficial for students who want to work on this project.

References:

For more information on the game, you can visit the following links:

1. The producer's website (<http://www.specialist-games.com/bloodbowl/>) with a downloadable copy of the rules of the game (<http://www.specialistgames.com/bloodbowl/assets/lrb/LivingRulebook4.pdf>)
2. FUMBBL (<http://fumbbl.com/>): an online league with many coaches, some of them really good. This site also stores log files of all (?) the games that are played online and will be a great resource for the project.
3. TalkBloodBowl: a Bloodbowl discussion site with some interesting strategy discussions.