

OPTIMALITY OF DRAFT BOT STRATEGIES

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ABSTRACT. We seek to formalize the notion of an optimal draft starting from the notion that it should ensure all players have pools which can produce roughly equal power level decks. We then expand on the notion of optimality to introduce algorithms for the bots to follow to maximize the optimality of the resultant pools from the draft.

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1. INTRODUCTION

1.1. Current Algorithms. The first step to assessing power level is to create a concept of card power level. CubeCobra currently has a system for this based on the ELO rating system traditionally used for chess 1. In this system we assign each card $c_i \in Cards$ a time-parametrized rating $elo_t : Cards \rightarrow \mathbb{R}$ for the which the following holds.

$$(1) \quad \forall t \in \mathbb{R}, \quad \sum_{c_i \in Cards} Elo_t(c_i) = C$$

From this value we define the quality of a card, $Q_t : Cards \rightarrow \mathbb{R}^+$ to be:

$$(2) \quad Q_t(c_i) = 10^{\frac{Elo_t(c_i)}{400}}$$

We define the predicted probability of c_i being picked over c_j to be assess picks as pairwise competitions where picking c_i from $\{c_1, \dots, c_n\}$

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is seen as c_i winning a head to head competition against each of the other members of the pack.

2. A FORMAL DEFINITION OF OPTIMALITY

3. PROPOSAL FOR BETTER COLOR ASSIGNMENT

4. PROPOSAL FOR LIVE ADJUSTMENT OF COLOR ASSIGNMENTS

REFERENCES

Wikipedia. (n.d.). *Elo rating system*. Retrieved from https://en.wikipedia.org/wiki/Elo_rating_system