

## Abstract

With an exploding global market and the recent introduction of online cash prize tournaments, fantasy sports contests are quickly becoming a central part of the social gaming and sports industries. For sports fans and online media companies, fantasy sports contests are an opportunity for large financial gains. However, they present a host of technical challenges that arise from the complexities involved in running a web-scale, prize driven fantasy sports platform. We initiate the study of these challenges by examining one concrete problem in particular: how to algorithmically generate contest payout structures that are 1) economically motivating and appealing to contestants and 2) reasonably structured and succinctly representable. We formalize this problem and present a general two-staged approach for producing satisfying payout structures given constraints on contest size, entry fee, prize bucketing, etc. We then propose and evaluate several potential algorithms for solving the payout problem efficiently, including methods based on dynamic programming, integer programming, and heuristic techniques. Experimental results show that a carefully designed heuristic scales very well, even to contests with over 100,000 prize winners. Our approach extends beyond fantasy sports – it is suitable for generating engaging payout structures for any contest with a large number of entrants and a large number of prize winners, including other massive online games, poker tournaments, and real-life sports tournaments.