
RICHARD HOSHINO, National Institute of Informatics, Tokyo
Hypergraph Edge Numbering and its Application to Game Show Scheduling

A year ago, I was contacted by the Executive Producer of *Splatalot!*, a medieval-themed TV game show for kids modeled after the hit American series *Wipeout*. The show featured nine “defenders” to “protect the castle”, consisting of three teenagers from each of Canada, Australia, and Britain. In scheduling the 27 episodes, two of the three defenders had to be chosen from each country to produce a six-person lineup, with the caveats that no six-person lineup could be chosen twice, and that each defender’s appearances were appropriately spaced to prevent fatigue and burnout. Specifically, the producers of *Splatalot!* had hoped to schedule the 27 episodes so that each defender would shoot 3 or 4 consecutive shows and then have a day off, but were unable to find a feasible arrangement.

In this talk, I will explain how this scheduling optimization problem was solved by re-converting it to an equivalent problem of numbering the edges of a hypergraph so that the numbers on the edges incident to each vertex were spread out as evenly as possible. We will present the optimal schedule given to the show’s Executive Producer, having the property that no defender would play four consecutive shows or sit out two consecutive shows. We conclude the talk by motivating a Ramsey-type problem for the general scenario of m out of n defenders chosen from each of k countries, and present various combinatorial techniques to determine an optimal episode arrangement schedule for any triplet (m, n, k) .