

Pro-Am Allocator Algorithm + Cost Function

Developed by Viran Weerasekera (2018-2019).

Objective Function (3v3)

Each speaker is assigned a number in the range $[1, n]$ where n is the number of speakers.

Minimise:

$$\sum_{i=1}^n \sum_{j=1}^n \sum_{k=1}^n c_{abc} x_{ijk}$$

Subject to:

- $x_{ijk} = 1$ if speakers i, j and k are matched together, 0 otherwise
- $c_{ijk} = 10^4 v_{ijk} + 10^3 p_{ijk} + 10^2 s_{ijk} + \infty e_{ijk} + \infty w_{ijk}$
 - $v_{ijk} = 1$ if the team is all-novice, 0 otherwise
 - $p_{ijk} = z$ where z is the number of times each speaker has preferences another speaker in the team¹
 - $s_{ijk} = 2^y$ where y is the number of novices without a debating background
 - $e_{ijk} = 1$ if the team is all-novice, 0 otherwise
 - $w_{ijk} = 1$ if an all-novice team has a dummy ‘swing speaker’ slot, 0 otherwise
- No team may contain more than 1 pro.

¹For example, if one speaker preferences another, $z = 1$. However, if those two speakers cross-preference each other, $z = 2$.