Symposium Scheduling: The Rener-Alsakh Algorithm

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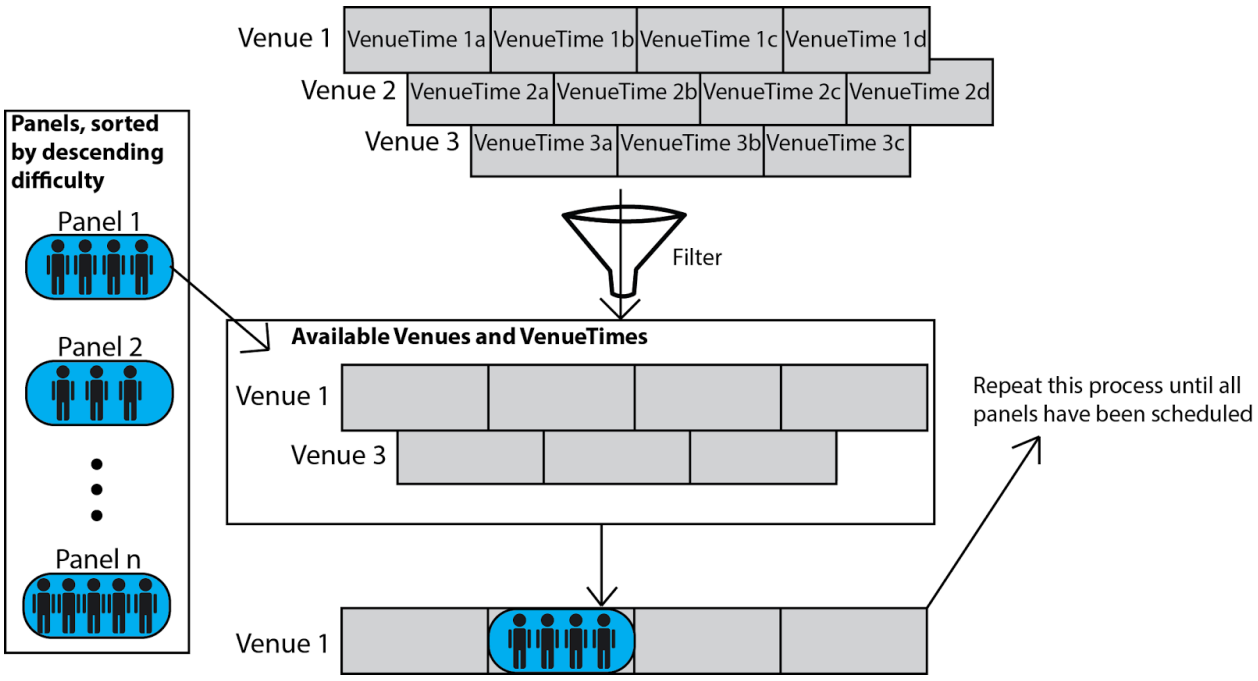

Section 1 – Forming the Model

1. **Parsing**
   - Extract information about the Panels, Panelists, Venues, and Venue timeslots from the supplied JSON file.
2. **Modeling**
   - Create an object for each Panel. Each panel will encapsulate the Panelists assigned to it, the times the panel is available to be scheduled at (based on the intersection of the Panelists' availability), and what constraints are tied to the Panel (each constraint is itself an object that can easily be checked for violations later).
   - Create an object for each Venue. Each Venue will encapsulate its name and what Venue timeslots (named *VenueTime*) are tied to it. These Venues are added to a list and sorted in ascending order by their size.
   - Create VenueTime Objects, which are essentially time ranges that can be filled by panels.

Section 2 – Sorting

2.1 Assigning Difficulty

- For each panel, rate the difficulty based on how many other panels share its category and panelists, how many available times it has, and the difficulty of its constraints.

2.2 Sort Panels

- Now that each Panel has a difficulty, put them into a list and sort them in descending order. Theoretically, the higher the difficulty, the higher up in the list the Panel is, and the sooner it will be scheduled.

Section 3 – Scheduling

3.1 Filtering

- Pop the first Panel from the list. Based on its constraints, filter out VenueTimes that it cannot be scheduled in. The remaining VenueTimes are then ranked based on how well they match the panel, considering things such as constraints, what is already scheduled in other Venues at that particular VenueTime, preferring earlier times before later ones, etc.

3.2 Place Panels

- Place the Panel in the first VenueTime in the list, which is the probable best fit. Move that VenueTime from the list to the filled list.
- Check its constraints and make note of any violations so that they can be reported.
- If the Panel cannot be scheduled (there are no available VenueTimes in the list) place it in the Unscheduled list and make notes of why it couldn't find a VenueTime.
- Return to step 3.1

What are Constraints?

Constraints are the objects we use to place conditions on when certain panels can be scheduled. This includes conditions such as a minimum size the Venue can be, the maximum number of times a panelist can be scheduled in a given day, or that two panels of the same category shouldn't be scheduled at the same time. These Constraints are provided by the user in the JSON file.