**Cell2Fire heuristics description**

Currently, the heuristics (greedy based) are executed for a hard-coded interval of treatment fraction, i.e., varying the total number of nodes to be treated by 5%, starting from 0% (no treatment) to 90% of the available cells. If a valid argument is provided, Cell2Fire simulates nsim fires, gathers statistics and useful information for the metrics, simulates nsim fires with the treatment plan provided by the heuristic, and finally, provides an evaluation of the treatment plan’s performance.

If more than one heuristic run is performed (sequentially), there is an external module (not included in the official release yet) that generates comparison plots across different heuristics.

In parenthesis the number of the heuristic associated with the --heuristic argument (--heuristic -1 indicates that no heuristic is applied).

* **Random (0)**: Selects available cells at random until the treatment fraction threshold is hit (e.g., 10% of the available cells)
* **Random\_Adj (1)**: Idem as above but satisfying adjacency constraints by selecting cells at random connected to the previous ones.
* **Max\_Utility (2)**: Given a utility map with a value for each cell (.csv file, see valueFile argument), it selects those cells that maximize the total utility.
* **Max\_Utility\_Adj (3)**: Idem but satisfying adjacency constraints (greedy)
* **Burnt\_Probability (4)**: Selects those cells with higher burn probability based on the previous simulations.
* **Burnt\_Probability\_Adj (5)**: Idem but satisfying adjacency constraints (greedy)
* **FPV\_Palma (6)**: Calculates the fire protection value from Palma et. al and selects those cells that maximize the total sum of the selection (slow, not recommended)
* **FPV\_Palma\_Adj (7)**: Idem but satisfying adjacency constraints (greedy)
* **DPV\_VaR\_Volume (8)**: Calculates the downstream protection value metric using the volume/provided utility per cell as the VaR to protect. Selects the cells of the forest that maximize the total summation of the metric.
* **DPV\_VaR\_Volume\_Adj (9)**: Idem but satisfying adjacency constraints (greedy)
* **DPV\_VaR\_Volume\_Degree (10)**: Idem as (8) but weighting the metric by the degree of the node.
* **DPV\_VaR\_Volume\_Degree\_Adj (11)**: Idem but satisfying adjacency constraints (greedy)
* **DPV\_VaR\_Volume\_Degree\_Time (12)**: Experimental. Adds a time factor weighting the metric by the ROS of the fire.
* **DPV\_VaR\_Volume\_Degree\_Time\_Adj (13)**: Idem but satisfying adjacency constraints (greedy)
* **DPV\_VaR\_Volume\_Degree\_Time\_Layer\_decay (14)**: Experimental. Adds a decay factor associated with how deep the node is to the ignition point. The farther, the smaller importance of the cell.
* **DPV\_VaR\_Volume\_Degree\_Time\_Layer\_decay\_Adj (15)**: Idem but satisfying adjacency constraints (greedy)
* **BCentrality (18)**: Calculates the betweenness centrality value for each node, selecting those that maximize the total summation.
* **BCentrality\_Adj** **(19):** Idem but satisfying adjacency constraints (greedy)