

IAF SPACE OPERATIONS SYMPOSIUM (B6)  
Mission Operations, Validation, Simulation and Training (3)

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## TOWARDS ENSEMBLE AI BEHAVIOURS FOR SATELLITE PLAN EXECUTION

**Abstract**

Plan execution in an opportunistic, non-deterministic, and stochastic environments such as observation satellite planning is a challenging area due to the likelihood of deviation from the plan. Current methods that tackle unforeseen events without replanning can be roughly divided into two main branches: failure recovery systems and opportunity planning.

These approaches have clear cut objectives that can conflict. The approach that we present intends to merge different voices (action selection algorithms) with possibly differing objectives and to exploit their benefits. The structure of the algorithm is based on previous work in combined state evaluation for general video game playing in which an arbitrator decides the final action to take given a set of evaluation inputs. We apply our approach to satellite plan execution by merging the different voices through an arbiter that decides the final action to be dispatched. The arbiter takes as input the action selected by each voice and a control parameter that can be used to tune the importance of each voice. This approach aims to create robust plan execution in which reactions can be tuned to the user's preference at each moment.