Problem

➢ A team of crew members are expected to perform a set of tasks (or achieve some goals) when on a mission.
➢ A human planner, who has a holistic view of the system can make a schedule for the crew.
➢ There may exist organizational and temporal ordering constraints which have to be accounted for when coming up with this schedule.

In this work, we come up with a schedule authoring system that aids the human planner to come up with a schedule that fulfills all the requirements.

Representation

➢ We model the scheduling problem as an automated planning problem and represent it using the Planning Domain Definition Language (PDDL).

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Scheduling Domain

➢ Previous work by NASA creates a plan authoring tool to aid human planners (focuses on UI design, does not use artificial intelligence in the backend to provide decision support).
➢ We create a mock scenario that makes a ten hour plan with four crew members in this domain to achieve a goal in which,

- Some science experiments have to be completed: CubeRRT, Advanced Diagnostic Ultrasound in Microgravity
- Some crew members need to exercise on a treadmill.
- Communication has to be done when the space craft is in line of sight with the ground station.
- Photos have to be taken for certain parts of the planet.
- Repair Tasks have to be performed on certain parts of the aircraft.

Plan Validation

➢ Plans being constructed can be validated using VAL at any point in time. VAL highlights the reason when it finds a plan being constructed is not valid.

Plan Correction and Plan Suggestion

➢ Possible plan completions given a partial plan can be suggested using Probabilistic Plan Recognition technology.

Explaining Suggested Plans

➢ When generated plans look inexplicable to humans, we can provide explanations based on model differences between the human and the system.