

Automated envisioning for spacecraft contingencies

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Summary: Space shuttle and space station flight controllers frequently perform a kind of reasoning we call envisioning. They imagine scenarios in which certain faults have occurred to see how it affects the mission. This allows them not only to respond more quickly should the imagined contingency arise but also to configure the spacecraft in advance to lessen the impact of the contingency should it occur. We present here the advisor system that automates envisioning. Given a planner written for any domain, it graphically displays what mission-critical contingencies it has found so far, what contingencies it is currently processing, and how much longer it will be until it has completely imagined all possible contingencies - i.e., finished envisioning. We also present our results with using it to envision in the Space Shuttle RCS domain.