

Evolution of the Spike Planning and Scheduling System

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Abstract

Spike is a general framework for planning and scheduling that was developed by the Space Telescope Science Institute for NASA's Hubble Space Telescope. This paper describes how Spike has been adapted to different missions and how the overall system has evolved with experience. Major architectural concepts which have emerged include the development of the Rmultistart stochastic repairS constraint satisfaction problem-based scheduler from an initial neural network approach and the development of planning via Rplan windowsS to provide stable plans in an unstable environment. In addition to over seven years of operational use for HST, Spike has been used for several other space- and ground-based observatories, including EUVE, ASCA and XTE and will be used in FUSE, AXAF and the ground-based European Very Large Telescope. This paper also illustrates how Spike is adapted to new missions.