Onboard and ground-based automated scheduling for the Mars 2020 Rover Mission

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The Mars 2020 mission has developed both onboard [Rabideau and Benowitz 2017] and ground-based [Yelamanchili et al. 2020a] scheduling to improve the science return of the mission. The flight and ground schedulers use the same algorithm: non-backtracking constraint-driven, grounded search due to flight computing limitations. We describe some of the challenges of rover scheduling including embedding in execution [Chi et al. 2018], enabling extremely limited, controlled backtracking [Agrawal et al. 2019], scheduling rover wake/sleep [Chi et al. 2020], ground-based Monte Carlo derivation of plan specific search heuristics [Chi et al. 2019], and tools for explainable scheduling [Yelamanchili et al. 2020b]. We then describe the status of the project and timeline for mission use.

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