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Towards optimal pass scheduling for SLR

The way satellite passes are scheduled has a significant influence on the productivity of a SLR system. In general we are interested in optimal scheduling, which means given a list of visible targets and an extendable set of constraints we want to generate a schedule that maximises the coverage of targets while also maximising the potential number of normal points per target.
The given set of constraints incorporates all tracking requirements for each target. Requirements can have very different forms starting from simple mission or campaign priorities up to more complex scheduling rules like with the “GREAT experiment”. The set of constraints is not static over time and has to be adapted in accordance with changing mission and campaign requirements. If we also consider full automated systems, non-target related constrains like weather forecast, current cloud coverage and other informations may be added. With the
ongoing completion and extension of new and existing global and regional navigation systems plus the inclusion of selected space debris object, the number of potential SLR targets will grow rapidly in the near future. The combinatorial nature of this scheduling problem together with the increasing number of targets and the changing requirements over time, make it hard to create, maintain and analyse an algorithmic solution. We have studied the potential usage of declarative technologies from the field of Artificial Intelligence as a promising approach.