

Air Traffic Controller Decision-Making Support using the Solution Space Diagram

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Abstract: Air traffic controller workload is considered to be one of the most important limiting factors to the growth of air traffic. The difficulty of a traffic control task can be analyzed through examining the problem's solution space, i.e., all possible vector commands that satisfy the various constraints. But apart from deriving metrics for workload, a visualization based on the solution space, resulting in the Solution Space Diagram, could also serve as an aid for alleviating controller workload. An experiment was conducted in which different levels of traffic were tested in order to evaluate the capabilities of the Solution Space diagram. The experiment entailed the task of merging aircraft into a single route and subjects provided subjective ratings of workload at fixed intervals of time. Depending on traffic level, significant effects of the Solution Space diagram were found on the reduction of controller workload.

Keywords: Air traffic control, decision support systems, human-machine interface
