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Integrating Human Preferences into the Automated Decisions of Unmanned Aerial Vehicles

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Abstract : Due to the nature of autonomous Unmanned Aerial Vehicles (UAV) missions, it is important that the decisions of a UAV stay consistent with the priorities of an operator, while at the same time allowing them to be easily audited and explained. We propose a multi-layer decision engine that integrates the operator (human) preferences by using the Multi-Criteria Decision Aiding (MCDA) methods. A software implementation of a UAV simulator and of the decision engine is presented to highlight the advantage of using such techniques on high-level decisions. We demonstrate that, with such a preference-based decision engine, the decisions of the UAV are compatible with the priorities of the operator, which in turn increases her/his confidence in its autonomous behavior.

Keywords : autonomous UAV, multi-criteria decision aiding, multi-layers decision engine, operator's preferences, traceable decisions, UAV simulation
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