Ethical Mission Definition and Execution for Maritime Robots under Human Supervision

As a sneak-peak courtesy, here is advance copy of a forthcoming publication.

Ethical Mission Definition and Execution for Maritime Robots under Human Supervision

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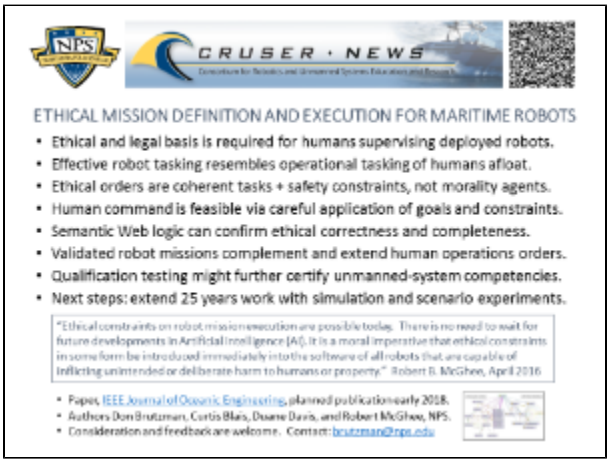
Abstract. Experts and practitioners have worked long and hard towards achieving functionally capable robots. While numerous areas of progress have been achieved, ethical control of unmanned systems meeting legal requirements has been elusive and problematic. Common conclusions that treat ethical robots as an always-amoral philosophical conundrum requiring undemonstrated morality-based artificial intelligence (AI) are simply not sensible or repeatable. Patterning after successful practice by human teams shows that precise mission definition and task execution using well-defined, syntactically valid vocabularies is a necessary first step. Addition of operational constraints enables humans to place limits on robot activities, even when operating at a distance under gapped communications. Semantic validation can then be provided by a Mission Execution Ontology (MEO) to confirm that no logical or legal contradictions are present in mission orders. Thorough simulation, testing and certification of qualified robot responses are necessary to build human authority and trust when directing ethical robot operations at a distance. Together these capabilities can provide safeguards for autonomous robots possessing the potential for lethal force. This approach appears to have broad usefulness for both civil and military application of unmanned systems at sea.



Index Terms — autonomous vehicles, robot ethics, Mission Execution Automata (MEA), Mission Execution Ontology (MEO)

Available: publication draft paper and summary flyer.

> *"Ethical constraints on robot mission execution are possible today. There is no need to wait for future developments in Artificial Intelligence (AI). It is a moral imperative that ethical constraints in some form be introduced immediately into the software of all robots that are capable of inflicting unintended or deliberate harm to humans or property." Robert B. McGhee, April 2016.*

Consideration and feedback are welcome. Contact: brutzman@nps.edu