



# By Air or by Land: How Locomotion Methods Dictate Drone Ethics

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**"God knows whether they'll strike us again or not. But they're always surveying us, they're always over us, and you never know when they're going to strike and attack."**

**"Even when you don't see them, you can hear them, you know they are there."**

**"When you can hear the drone circling in the sky, you think it might strike you. We're always scared."**

**"Children, grown-up people, women, they are terrified... They scream in terror." [1]**

## Introduction

Unmanned aerial drones are now common weapons used by governments in warfighting. More recently, legged robots are garnering attention to be used in similar applications. We propose that legged drones will be deployed in substantially different environments than aerial drones and that this difference necessitates a new set of ethical guidelines.

## Drone and Human Interactions

Ground drones will likely be deployed much closer to their targets, such as in cities or villages. Due to this, ground drones are subject to humans (both combatants and civilians) acting upon them. Robots must be capable of rapidly analyzing and reacting to situations where they and/or others might be at risk. How accurately can a robot assess a situation where, for example, they are knocked over by a human?

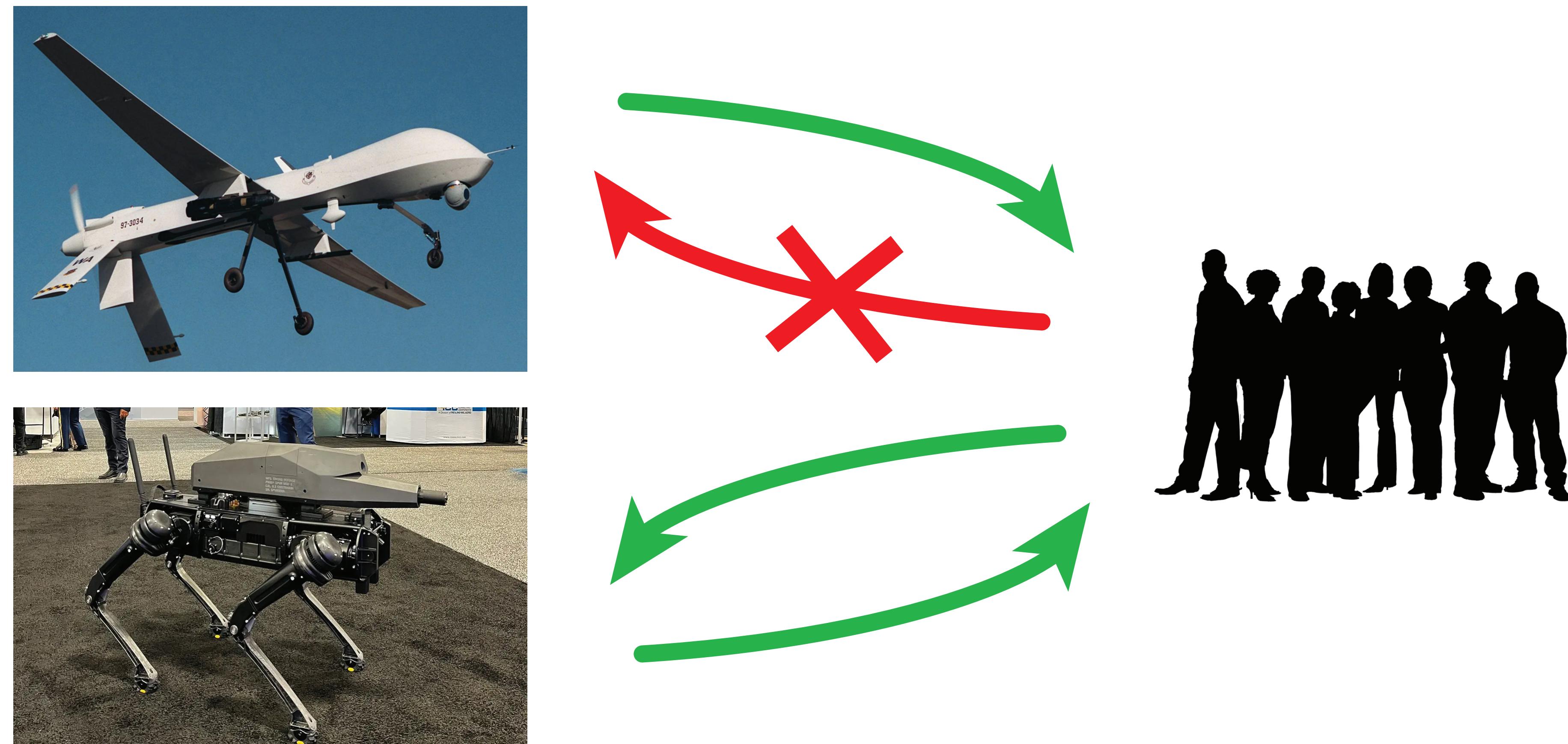


Fig. 1: There is a crucial difference in how aerial and ground drones must interact with humans. Specifically, ground drones are subject to human actions being imposed upon them and must have a nuanced understanding of how to react properly.

## Robot Self-defense

In the above scenario, any level of retaliation implies the robot has a right to self-defense. Even if there are situations where a robot is entitled to respond with lethal force, the humanitarian cost of retaliating inappropriately would be astronomical. Current robotic technology is vastly unequipped to handle these complex interactions.