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Autonomy—A definitional Challenge in Drone Regulation



Silhouette of quadcopter drone hovering near the city. Photo by [Soh Rhy Yan](#) on Unsplash

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Independent • International • Interdisciplinary

Regulatory Definitions

- **Europe:**

An operation during which an unmanned aircraft operates without the remote pilot being able to intervene.

- **Australia:**

*'An operation of an unmanned aircraft that does not allow pilot intervention in the management of the flight of the aircraft'
further explains,
'one in which there is no ability for the pilot to intervene in the conduct of the flight'*

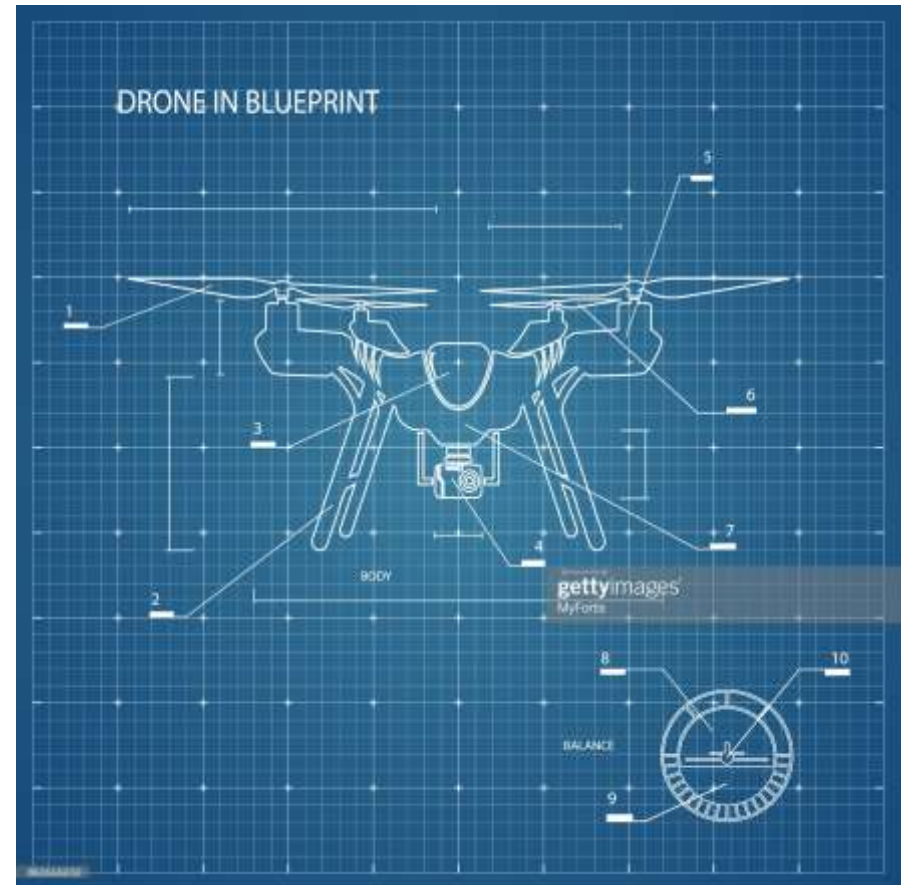
- **United Kingdom:**

The concept of an “autonomous” UAS is a system that will do everything for itself using high authority automated systems

High authority automated systems – those systems that can evaluate data, select a course of action and implement that action without the need for human input. Good examples of these systems are flight control systems and engine control systems that are designed to control certain aspects of aircraft behaviour without input from the flight crew.

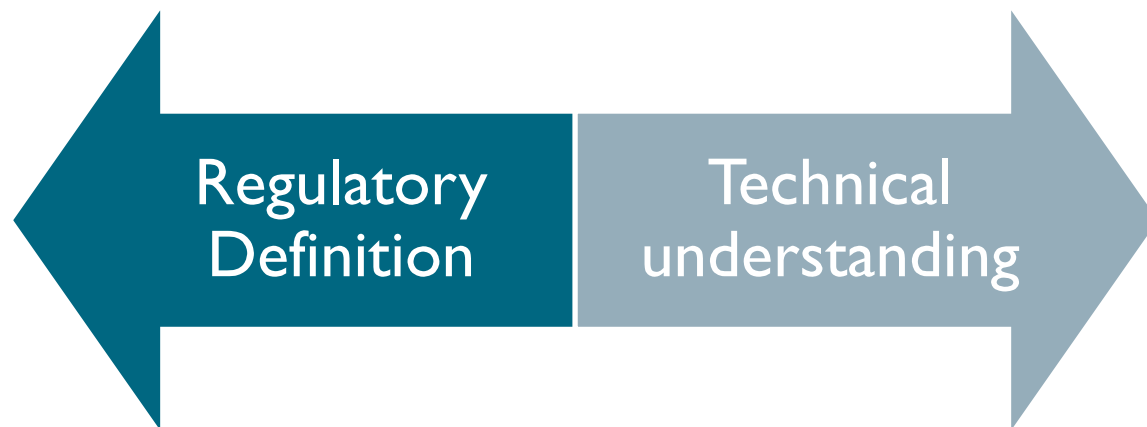
Deviation from Technical Understanding

- Operational Perspective
- Human Factor and Ergonomics literature
- Conception in other autonomous systems:
 - *Self-driving Cars*
 - *Autonomous Weapon Systems*
 - *Autonomous Maritime Ships*



Problem

- Objective
- Sets high threshold



- Spectral
- Focus on classification

Regulatory Implications

- Furtherance of Regulatory Lag
- Ineffective Safety Oversight
- Potential Disharmony with EU AI framework
- Implications for Drone Traffic



PhD Project

REGULATION OF DRONE AUTONOMY: Implications for European Airspace



Illustration of a quadcopter drone (powered over the air) flying over a city skyline.

DRONES ARE SLOWLY POPULATING CIVILIAN AIRSPACE



A commercial jetliner flying above a smaller drone. Source: <https://www.foxnews.com/tech/drones-air-traffic>

THEY POSE SAFETY AND SECURITY THREATS TO SOCIETY



Courtesy: China's Drones fall from sky as military tightens drone operations law. (Newsweek, March 16, 2021).

MORE AUTONOMY WOULD BEAR FURTHER IMPACT ON SAFETY AND SECURITY CONSIDERING, AMONGST OTHER, FOLLOWING FACTORS:

- Issues relating to Artificial Intelligence (AI)
- Experience with other autonomous technologies such as, self-driving cars.
- Human-drone interaction issues as more autonomy is infused in drones.

WHAT THIS PROJECT IS NOT ABOUT...

- Military or law enforcement use of drones
- Privacy or environmental implications of drones
- Preparing concrete taxonomy for drone autonomy

DISCIPLINES UNDER FOCUS

- Law
- Security Studies
- Science and Technology Studies (STS)

STRUCTURE OF ARTICLES:

'Autonomy—A Definitional Challenge in Drone Regulation'

- Discussion between regulatory definition of 'autonomy' and technical understanding of the concept.
- Focus on regulations in Europe, UK, Australia and US.

'Safety and Security Implications of Autonomous Drones'

- What 'safety' and 'security' threats are posed by autonomous behavior of drones.
- Real-time viability of autonomous systems and potential factors that drones with autonomy can cause.

'European Regulation of Drone Autonomy'

- Analysis of European regulations from the perspective of drone autonomy
- Potential conflicts with other European frameworks.

'Drone Autonomy Framework for Safe European airspace?'

- Considering the findings in the two articles, this article will question if the current European approach towards addressing it, works and, and if yes, to what extent?
- This article would also discuss possible regulatory solution(s) to deal with the increase of autonomy for safe European airspace.

Amel Elwan, MSc,
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Thank you