

**Fly-Crash-Recover: A Sensor-based Reactive Framework for Online Collision Recovery of
UAVs**
(Technical Report)

The Personification of Political Ideologies within Drones
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Sciences
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science in Systems and Information Engineering

Author

Ryan Remias
May 1, 2020

Table of Contents

SocioTechnical Synthesis.....	3
Technical Report.....	4
Technical Report as Required by Department.....	5
STS Thesis.....	11
Thesis Body.....	12
References.....	27
Thesis Prospectus.....	29
Prospectus Body.....	30
References.....	39

SocioTechnical Synthesis

Drones are increasingly used to traverse unknown or dangerous environments. Rising presence in air traffic necessitates the development of drones to react and respond appropriately if unexpected crashes occur. This capstone project analyzes how drones react during a collision. Tests will be conducted by crashing the DJI Tello and Crazyflie drone into several different objects. Data on how they respond to collision will be collected and analyzed, allowing for the appropriate recovery method to be theorized and implemented within the drones. The drones and the implemented programming system serve as the overarching technology used to effectively recover from a significant, unexpected impact. That being said, the resiliency of drone technology has a major impact on society since it is so widely used. In the military, drones embody a new age of warfare tactics used to subdue threats with merciless precision. Mass production and delivery companies like Amazon revel at the opportunity for drones to deliver products at the doorsteps of customers. By improving their resiliency, drones will allow different people to find uses for them in a robust and safe manner.

In order to analyze the relationship between drones and society, I will use the theory of technological politics. This theory argues that technologies like drones can have an active role in society and that it can even personify the political ideology of the entity using it, allowing for the technology to in turn, impact society through its inherent capabilities. Using several case studies of drone usage in the military, commercial aviation, surveillance, and scientific research, I will conduct an extensive literature review of relevant documents and accounts to understand this relationship. I believe that this research will shed further light to several moral and ethical dilemmas that both drones and drone users face. Addressing these issues will allow for a deeper understanding to drones and their role in society and how they both impact each other. For example, as used in the military, this paper will show how drones are becoming the embodiment of advanced warfare, aiding operators in taking down terrorists with merciless precision. However, the paper will highlight drawbacks of using drone strikes, such as civilian fatality or post-traumatic stress disorder within operators. Thus, as drones evolve and are deployed by new users, their resiliency to inevitable collisions must be developed and the different ideologies they personify must be understood. By understanding both in concert, society will better be able to utilize this technology in a safer manner in more complex missions for a broader range of users.