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Master Thesis Defense

Entitled

*ASSESSING OPEN SOURCE TOOLS FOR ENHANCED FORENSIC ANALYSIS OF UNMANNED AERIAL
VEHICLES (UAVS)*

By

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Date & Venue

Wednesday, 29 Nov 2023

03:30 PM

Room 1058 , E1 Building

Abstract

The widespread applications of Unmanned Aerial Vehicles (UAVs), commonly referred to as drones, has given rise to significant national security threats due to their illicit activities. Consequently, the domain of UAV forensics is rapidly evolving, presenting a substantial knowledge deficit among forensic experts. Open-source tools provide accessible and affordable resources, making it easier for investigators to bridge this gap by gaining expertise in the use of these tools. This helps ensure that forensic professionals can keep up with the ever-changing UAV technology landscape. This thesis undertakes the mission of navigate the complex field of drone forensics and conducting a comprehensive assessment of Open Source Tools to enhanced Forensic Analysis of UAVs. The overarching goal is to enhance drone forensic investigations and reinforce national security within the UAE. The paper offers an exhaustive state-of-the-art review of drone forensics, with a particular emphasis on innovative solutions designed to address digital forensics challenges. Additionally, it delves into the pivotal role of open-source tools in the analysis of drone flight log data and assesses their reliability. The study centers its analysis on the dataset FLY035, extracted from the popular DJI Phantom III model and sourced from the Computer Forensic Reference Datasets (CFReDs) project powered by VTO Labs, a reputable and independent institution specializing in drone-related data and research. The study employs a combination of open-source tools, including CSView, Autopsy, and QGIS, to meticulously extract and identify critical artifacts embedded within the recorded flight logs. The results of this analysis involve the extraction of vital information, including flight paths, geospatial coordinates, altitude, and timestamps. Through systematic analysis and correlation of these artifacts, the research contributes to the advancement of drone forensics by providing a theoretical drone forensics framework. This thesis is valuable for investigative efforts, highlighting the importance of open-source technology for sustainable development as an accessible, transparent and cost-effective solution and a practical guide for professionals who seek to leverage open-source resources for forensic investigation and aligns with the UAE's strategies in facilitating the safe use of drone technology while preserving national security.

Keywords: Drone, Unnamed Areal Vehicle, Forensic Analysis, Open Source Tools.