

DESIGN RESEARCH BASED DEVELOPMENT OF CAMOUFLAGE LANDSCAPE FEATURES TO PREVENT CRIMINAL UAV ACTIVITY

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1 ABSTRACT

The popularity of small consumer drones (UAVs) has prompted increased use of these vehicles in and around public outdoor spaces, with expected commercial drone numbers to reach nearly 7 million by 2030 (FAA). Research in landscape architecture related to UAV (drone) use in public space to date, has just begun to address conceptual approaches to landscape assessment, representation, and park user behavior (Kullmann, Park). While research related to the development of countermeasures for security purposes is more extensive, no research to date addresses the development of landscape countermeasures for the use of UAVs in criminal activities. The paper presents design-based research (DBR) methodology and findings funded by a multiyear, multidisciplinary NSF grant to develop landscape architectural interventions that discourage the use of UAVs for criminal purposes at correctional facilities.

Consistent with design based research (DBR) models (Brown), this project is complex, incorporating the development of a) landscape assessments for potential UAV launch and landing sites around prisons; b) the creation of UAV tracking and monitoring systems, and c) the development of model countermeasures. The paper describes design and placement of embedded landscape features utilizing landscape camouflage principles for UAV detection systems in forested upstate North Carolina. Modelled camouflage mimicked landscape features and were fabricated in two stages: 1) landscape superstructure, and 2) landscape camouflage. The embedded landscape features incorporated a launch warning system capable of alerting prison officials of drone launch locations, identifying future drone operators, and predicting drone flight paths.

Keywords: Design Based Research, Drones, Prisons, Security Countermeasures