US 20240214394A1

(54) **ATTACK DETECTION AND COUNTERMEASURES FOR AUTONOMOUS NAVIGATION**

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Publication Classification

(51) **Int. Cl.**
H04L 9/40 (2006.01)
(52) **U.S. Cl.**
CPC **H04L 63/14** (2013.01)

(57) **ABSTRACT**

Autonomous navigation cyber-attack detection and/or avoidance techniques include visual and inertial odometry (VIO) algorithms to provide a root-of-trust during navigation, VIO algorithms that cross-validate navigation parameters using IMU and visual data, and hardware-dependent attack survival mechanisms that support autonomous systems during an attack.