Taylor Cox

Clustering Analysis of US and Chinese Drone Technology

Portfolio in Applied Statistical Modeling

Abstract:

Unmanned Aerial Vehicles (UAVs) have been a central component of US military strategy since the “War on Terror.” However, the United States is not the only country using UAVs. For example, the United Arab Emirates and Saudi Arabia deployed UAVs in Yemen, and both Russia and Ukraine rely heavily on UAVs in the ongoing civil war. China has become a major UAV exporter as countries seek to add UAV technology to their military arsenals. China exports to 37 countries and is the third largest UAV exporter behind the United States and Israel. As UAVs become more prolific worldwide, it is critical to global security to understand how China’s emergence in the UAV market impacts UAV deployment. Previous studies explore how UAV strikes harm civilians and undermine national security but fail to consider China’s effect on UAV proliferation.

This study seeks to identify patterns in UAV deployment to understand better the differences between Chinese UAVs and US UAVs in conflict. An agglomerative clustering algorithm, optimized on silhouette score and compared against a K-Modes algorithm using an Adjusted Rand Index (ARI) was used to identify 5 clusters in the data. The data was created from the Stockholm International Peace Research Institute (SIPRI) Armed Transfers Database and the Armed Conflict Location and Event Database (ACLED).

The clusters suggest that countries importing UAVs from the United States conduct UAV strikes more similarly than countries importing UAVs from China regarding UAV strike location, target, and fatality count. Clusters in which countries imported UAVs from China tended to target civilians. In contrast, clusters in which countries imported UAVs from the United States tended to target terrorist groups like the Islamic State.