1. **Research Title:** Pattern of Life (PoL) Modeling with Movement Data
2. **Individual Sponsor:** List the AFRL research topic sponsor's contact information

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3. **Academic Area/Field and Education Level**

   Mathematics, Statistics, Data Science/PoL – Anomaly Detection (BA/BS, MS or PhD level)

4. **Objectives:** The objective of this research is to develop an innovative approach to develop a dynamic PoL model that is capable of remaining stable while the data domain shifts over time. The dynamic Pol model should consider movement data. Movement data is well-documented in the literature to be constantly shifting both over time and space. Additionally, and of great value and interest, the dynamic PoL model could consider information fusion from alternate sources such as weather or social media to enhance the movement dataset.

5. **Description:** In the Air Force, there is value in the ability to fuse together raw data across ground, air, and marine sources to produce actionable information. One of the main keys in building effective actions is the capability of informing and updating existing PoL models while also leveraging information derived from individual sources.

   For example, a valuable PoL model is a spatio-temporal representation that is stable over a given time period and area; however, to be actionable and relevant, it should be appropriately receptive to changes in the environment over time.

   The researcher will identify, with support from AFRL, a spatio-temporal movement dataset over a suitable period of time and sufficient area to create a stable PoL model capable of representing "normalcy". The researcher will also identify or develop a methodology to quantifiably capture anomalous activity and provide appropriate performance metrics, which should include analysis into appropriate stability measures. Programming languages such as Python© and R© may be appropriate to accomplish the statistical work. Necessary methods may include information fusion, statistical models, and machine learning among others.

6. **Research Classification/Restrictions:** Unclassified

7. **Eligible Research Institutions:** DAGSI