

## **Temporal Data Mining Solutions for Sustainable IT Ecosystems**

**Sponsor: Hewlett-Packard Labs Innovation Research**

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### **Abstract:**

This project will design new temporal data mining algorithms for lifecycle modeling and sustainability characterization of IT ecosystems. We exploit the fact that all major IT systems today produce massive amounts of data, through measurements and monitoring of a rich plethora of temperature, humidity, airflow, and power. We will develop algorithms and approaches to process these massive sensor data streams, to infer multi-level temporal patterns from them, and to conduct sustainability characterization of the resulting patterns. Data mining hence supplies the crucial “in between” representation that bridges low-level data streams with system-level lifecycle modeling. Our patterns will help form input-output models of IT infrastructure which can then be composed and tuned for specific criteria. This can help us identify and debug anomalous/inefficient behavior in existing system configurations, conduct multi-objective optimization of IT systems, and improve energy efficiency at all levels in the enterprise.