Physical State Analytics with Machine Learning

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Who is Sandeep & Jaime
This is where the subtitle goes

Jaime Sanchez

Sales Engineer for Splunk
• With Splunk for 2.5 years

Experience
• Security, IT Ops, Business Analytics
• Technical Sales: Virtual Team & Field
• Current: Virtual Team

Favorite Factoid:
• It would take ~ 1 million mosquitoes, each sucking once, to completely drain the average human ~ Chris

Sandeep Vasani

Forward Deployed Software Engineer
• 10 months @ Splunk
Agenda

- What is Physical State Analytics
- Basic overview of sensors
- How did we do it?
  - Machine Learning with Splunk
  - Data Collection
- Demo
- Quick Recap
What is Physical State Analytics

General Overview
Physical State Analytics

What does it consist of…Time Travel?

- Space
- Time
- Real-time data collection & Analytics

Consists of **Spatial** and **Temporal** contextual information
What Problem Are We Solving?

Why is sensor data important?

Sensor Data can be leveraged for commercial applications for detecting movement pattern and prediction.

What is our movement: stationary, walking, running?
Mobile Phone Sensors

- **Ambient Light**
- **Proximity**
- **Cameras**
- **GPS**
- **Accelerometer**
- **Gyroscope**
- **Microphone**
- **Compass**

- **Phone Usage**
  - Light Sensor – Screen Dimming
  - Proximity – Phone usage
- **Content Capture**
  - Camera – Image/Video Capture
  - Microphone – Audio capture
- **Location Mapping**
  - GPS – Global Location
  - Compass – Global Orientation
- **Device Orientation**
  - Accelerometer & Gyroscope – Local Orientation
Measures changes in velocity along the x, y, and z axes

Measures the rotation rate around the x, y, and z axes
How Did We Do It?

General Overview
Splunk's App Ecosystem contains 1000’s of free add-ons for getting data in, applying structure and visualizing your data giving you faster time to value.

The Machine Learning Toolkit delivers new SPL commands, custom visualizations, assistants, and examples to explore a variety of ml concepts.

Splunk Enterprise is the mission-critical platform for indexing, searching, analyzing, alerting and visualizing machine data.

**Operationalized Data Science Pipeline**

- **Collect Data**
- **Clean & Munge**
- **Search & Explore**
- **Pre-processing Feature Selection**
- **Choose Algorithm**
- **Build, Test, Improve Models**
- **Operationalize Monitor Alert**
- **Visualize & Share**

**Ecosystem**

- Splunk
- Splunk
- Splunk
- MLTK
- MLTK
- MLTK
- MLTK
- Ecosystem

**Platform for Operational Intelligence**
Data Collection

- **iPhone**
  - Sensor Data Stream (app)
  - UDP
  - Python Script
    - 8810 (state=0 i.e. stationary)
    - 8820 (state=1 i.e. walking)
    - 8830 (state=2 i.e. running)

- **MLTK**
  - Platform for Operational Intelligence
  - UDP
Use Cases and Applications

General Overview
Applications

Where can I use this data?

- **Health**
  - Track health and wellness

- **Marketing**
  - Advertising

- **Social Networks**
  - Classification of what state the user was in while interacting with social media (like taking a picture)
1. Valuable insights from Sensor data

2. Experiment with features and algorithms
   • Not all features created equal

3. The more data the better
   • E.g. Different orientations of holding the device

Key Takeaways
This is where the subtitle goes
Thank You

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