



Engineering Analysis Task Team (EATT)

Evangelos Farantatos (EPRI) – Co-Lead

NASPI Meeting

September 26 2017

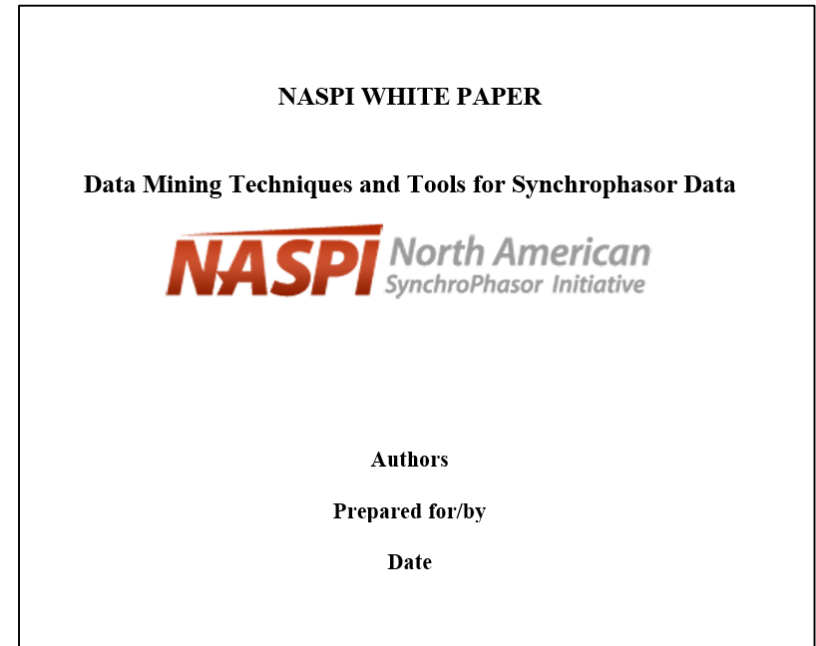
Springfield, MA

Present Activities

- **Data Mining Techniques and Tools for Synchrophasor Data**
 - **NASPI White Paper**
 - **Lead: Brett Amidan (PNNL)**

White Paper Focus:

- give a high level overview of data mining
- review how data mining has been used in industry
- present common big data architectures, software languages and tools that facilitate data mining
- provide use cases that show how data mining has been applied in the power systems community
- discuss possible future ways to apply data mining to the power grid and more specifically with synchrophasor data



Data Mining Techniques and Tools for Synchronphasor Data - **Outline**

1. Introduction

- Synchronphasor Data and PMUs Background
- Data Mining Background
 - Use of Data Mining in Other Industries
- Big Data Architecture Background

2. Data Mining Techniques

- Feature Extraction
- Clustering (Unsupervised Learning)
- Classification (Supervised Learning)
- Model-based Approaches
- Aggregation Strategies

3. Data Mining Tools

- Big Data Platforms and Databases
- Software Languages
 - Open Source
 - Commercial
- Data Mining Software
 - Open Source
 - Commercial

4. Use Cases

- Data Mining Applications in Power Grid
- Data Mining with Synchronphasor Data

5. Conclusions

Contributors:

- PNNL – Bret Amidan
- ORNL – Femi Omitaomu
- LLNL – Philip Top
- ATC – Xiangyang Zhou
- PingThings – Sean Murphy
- SAS – Greg Link
- CSRA – Tom Rizy

**Contact us if you are
interested to contribute**

Goal: Finalize white paper in 2017

New Business

- Topics of Interest for New Activities (White Papers, Technical Reports, Surveys, R&D, Workshops etc)
 - R&D: Cyber-physical modeling of power systems including PMU network - applications perspective
 - R&D: Forced Oscillations - Algorithms/tools for oscillation source location
 - Guide: Post-fault event analysis streamline process. Valuable for vendors for tool development
 - R&D: PMU Emulator