Call for Papers:

Large Scale Data Analytics in Transportation and Railway Infrastructure

Background

Currently the increased use of sensors, imaging systems and other emerging techniques in transports and railway infrastructure testing, monitoring and control are enabling massive amount of information and data to be generated at unprecedented scales. Data are generated in such volumes making it very difficult to draw appropriate conclusions. Processing of these large sets which are the magnitude of terabytes to petabytes demand new tools, and new algorithmic, probabilistic and statistical techniques. Despite the advance in large storage, high computational power, mining and drawing inferences from large scale data in critical infrastructure has some challenges: (a) standardization of data format, (b) accurate modeling, (c) clustering and classifying, (d) integrating data from independent sources and finally, (e) uncovering hidden patterns and information, (f) hidden correlation and (g) interpretation.

Objectives

1. Explore how big data is changing civil engineering (transportation and railway engineering) research and practice
2. Explore new techniques for managing and modeling large scale data
3. Develop new researcher and practitioner in handling large data in civil engineering (transportation and railway engineering)

The Big Data Analysis workshop is expected to bring together around participants from the Department of Transportations (DOTs) and consulting engineers, academicians and researchers from different institutions. Discussions will focus on issues related to the transportation infrastructure although the outcomes could have broader implication. Workshop participants will present practical applications, methods of handling large data and expected deliverables will be a series of articles in various areas of transportations, including railway engineering. Also the workshop will develop a circular on Data Analytic for Transportation Engineering.

Topics

- Data Collection and Management
- Designing Big Data Systems
- Tool and Technologies
  - Deep Analytics
  - Predictive Analytics
- Large Scale Computing Platform
  - Cluster Computing
  - Cloud Computing
- Grid Computing
- Heterogeneous Computing
- Randomized Algorithms
- Mining of Large Data
- Tensor Methods and Analysis
- Graphical Methods and Analysis
- Image Processing Tools
- Case Studies