VAST Challenge 2017 MC2

Mini-Challenge 2 Overview

Ornithology student Mitch Vogel was immediately suspicious of the noxious gases just pouring out of the smokestacks from the four manufacturing factories south of the nature preserve. He was almost certain that all of these companies are contributing to the downfall of the poor Rose-crested Blue Pipit bird. But when he talked to company representatives and workers, they all seem to be nice people and actually pretty respectful of the environment.

In fact, Mitch was surprised to learn that the factories had recently taken steps to make their processes more environmentally friendly, even though it raised their cost of production. Mitch discovered that the state government has been monitoring the gaseous effluents from the factories through a set of sensors, distributed around the factories, and set between the smokestacks, the city of Mistford and the nature preserve. The state has given Mitch access to their air sampler data, meteorological data, and locations map. Mitch is very good in Excel, but he knows that there are better tools for data discovery, and he knows that you are very clever at visual analytics and would be able to help perform an analysis.

Mini-Challenge 2 provides a three month set of data for you to analyze, covering April, August, and December 2016.

VAST 2017 Pages

- Overview
- Mini-Challenge 1
- ***Mini-Challenge 2***
- Mini-Challenge 3
- Grand Challenge
- Previous Challenges

Mini-Challenge 2: Your Challenge

The primary job for Mitch is to determine which (if any) of the factories may be contributing to the problems of the Rose-crested Blue Pipit. Often, air sampling analysis deals with a single chemical being emitted by a single factory. In this case, though, there are four factories, potentially each emitting four chemicals, being monitored by nine different sensors. Further, some chemicals being emitted are more hazardous than others. Your task, as supported by visual analytics that you apply, is to detangle the data to help Mitch determine where problems may be. Use visual analytics to analyze the available data and develop responses to the questions below. In addition, prepare a video that shows how you used visual analytics to solve this challenge. Novel visualizations and analysis approaches are especially interesting for this mini-challenge. Please do not use any other data in your work (including other Internet-based sources or other mini-challenge data).

You may use tools you developed in other VAST Challenges in your efforts – please let us know when you do so!

Questions

1. Characterize the sensors' performance and operation. Are they all working properly at all times? Can you detect any unexpected behaviors of the sensors through analyzing the readings they capture?Limit your response to no more than 9 images and 1000 words.

2. Now turn your attention to the chemicals themselves. Which chemicals are being detected by the sensor group? What patterns of chemical releases do you see, as being reported in the data? Limit your response to no more than 6 images and 500 words.
3. Which factories are responsible for which chemical releases? Carefully describe how you determined this using all the data you have available. For the factories you identified, describe any observed patterns of operation revealed in the data. Limit your response to no more than 8 images and 1000 words.

Download the Submission Form and the Data

Click on the link below to see the Submission Instructions. Enter your email in the box below to download the data for this mini-challenge. This email will be used if the conference organizers need to contact you regarding any corrections to the mini-challenge.

VAST Challenge 2017 Submission Instructions

VAST Challenge 2017 MC2: Download Files

- MC2 All Data Files

FAQ

Q: What are the dimensions of the map provided?
A: 12 miles by 12 miles.

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