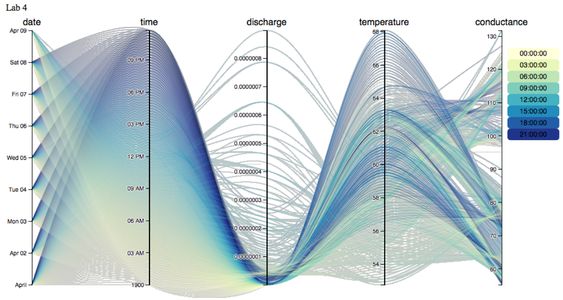

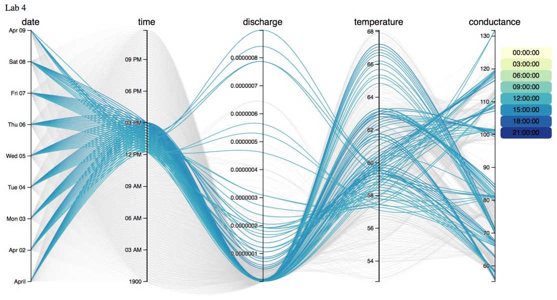

# Parallel Coordinates

In this lab you will continue working with multivariate data using a new visualization, parallel coordinates. "**Parallel coordinates** are a common way of visualizing high-dimensional geometry and analyzing multivariate data. To show a set of points in an n-dimensional space, a backdrop is drawn consisting of n parallel lines, typically vertical and equally spaced.[1]"

## Setup Lab 4

Download the `parallel.html` skeleton code and `data.csv` file from Moodle. We will be working with data collected from Dr. Johnston (ENV) about streams in the Lake Norman area. This is a good data set to work with parsing and filtering data.

## Data Parsing

There is a lot of data in this file. Start by reading in the file and parsing the data into the correct formats of numbers and time, and setting all empty values to `null`. For this lab you will not want to use the precipitation data.

```
d.conductance = (d.conductance === "") ? null : +d.conductance;
```

To draw our parallel coordinates we need to have a data value for all of our variables of interest (date, time, discharge, temperature, and conductance). After you have parsed your data, `filter` it by removing any line in your data where there is a `null` variable. For example, the following code will remove any line where the temperature is `null`:

```
data = data.filter(function(d){
    return d.temperature !== null;
}
```

[1] https://en.wikipedia.org/wiki/Parallel_coordinates

There is a lot of data even after you filter out the incomplete data. To make the data more manageable, I recommend to filter it again. For example, I removed all data from before April 2017. This let me work with 9 days of data.

### Axes

I have defined your axes of interest by creating a variable, `dimensions` of all the headings that you want to plot on your parallel coordinates. This data is continuous ratio data. [**Discussion**] **1.** Why do you want to use continuous ratio data for parallel coordinates? How would you plot categorical data as one of your axes in parallel coordinates, and why is this a challenge?

I have defined the domains based on the dimensions that will be plotted on each axis. You need to define the `domain` and `range` *forEach* dimension of the `y` axis. The following code will set the temperature y-axis.

```
y["temperature"] = d3.scaleLinear()
    .domain(DEFINE YOUR DOMAIN)
    .range([height, 0]);
```

### Color Map

Chose an appropriate color map for your data and setup and define your color map in your code. Chose a variable of interest other than time (I applied a color map to time), determine if your data is nominal, ordinal, or ratio, and if your data is discrete or continuous. [**Discussion**] **2.** Justify your colormap choice for your data.

### Legend

Finally, there is commented out code to create a legend for your data. To make this code work, you must define an array of data to define your legend buttons. For example, my legend contained 8 times throughout the day from “00:00:00” to “21:00:00”. I then grouped all of my data points into these 8 discrete categories. For example, when the “12:00:00” button is selected, all lines between “12:00:00” and “15:00:00” are highlighted.