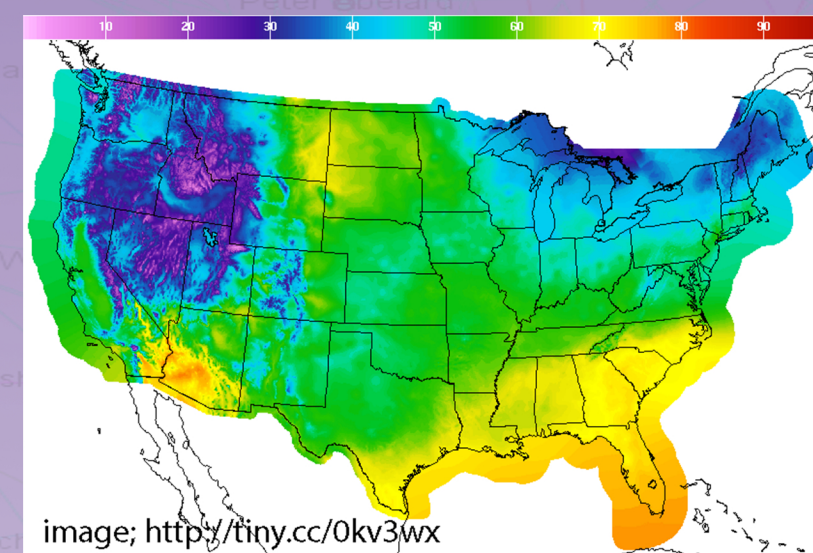# MOBILE VISUALIZATION

Introduction

We can represent quantities by numbers. We can represent quantities by numbers. What if we have a set of unintelligible number series, such as hourly stock prices, instantaneous exchange rates, or your city's population? It's hard to understand, isn't it? How can we make random numbers look more meaningful?

Visualization

Visualization is any technique for creating images, diagrams, or animations. Visualization can be used to interpret some issues effectively. Basic idea of visualization is to represent numbers as a meaningful picture. Google and several other companies have visualization APIs.
(Application Program Interface).

image: http://tiny.cc/0kv3wx

Mobile Visualization

Mobile devices have become a major part of our lives. Mobile platforms are at the center of attention of users. Mobile applications are the top trend nowadays. There are high varieties of new mobile devices and platforms such as Google's Android. However, there are not many studies in the area of mobile visualization. There are some web-based visualization usages, but they are built for high performance desktop computers. Most of them are not efficient enough to work on mobile devices.

Our Project

The goal of this project is to develop a mobile-device based visualization and analysis module for large-scale dataset. Visualization makes it possible to generate images or visual representations from large quantities of dataset. We chose Android platform for our project.
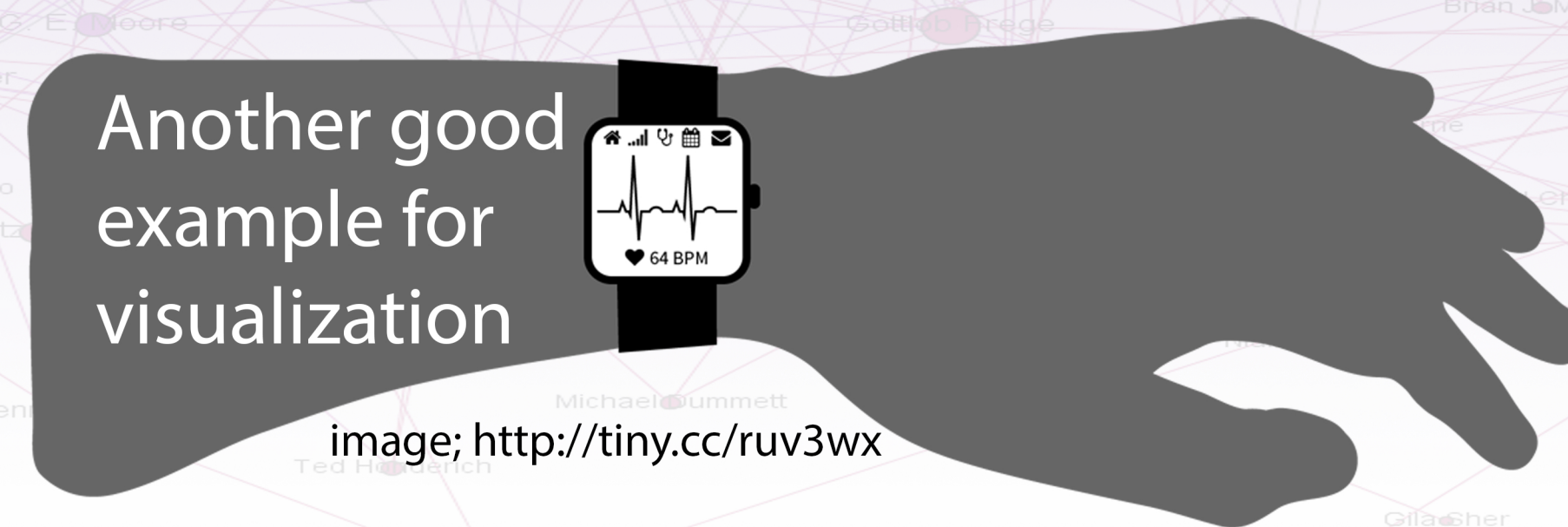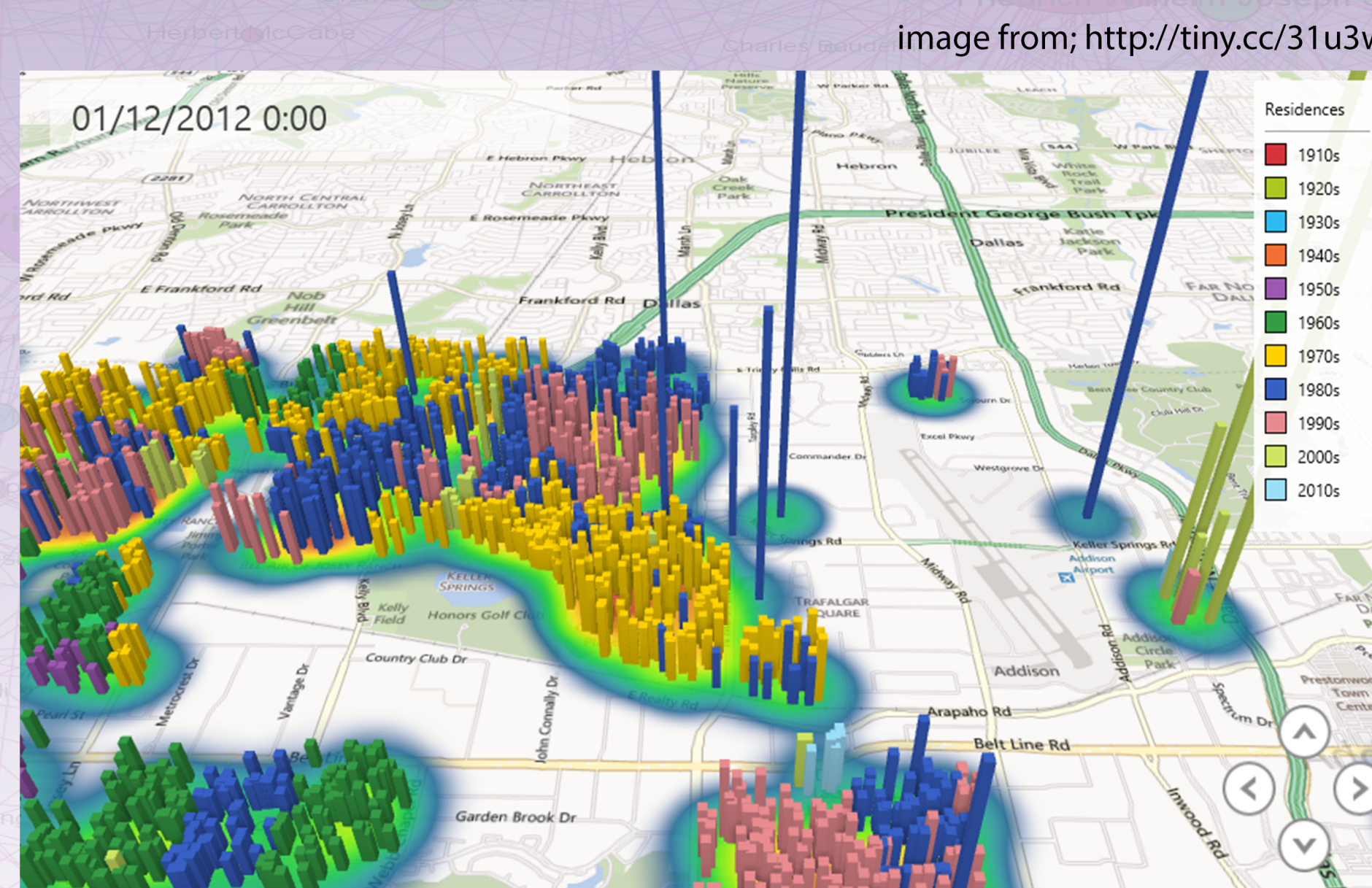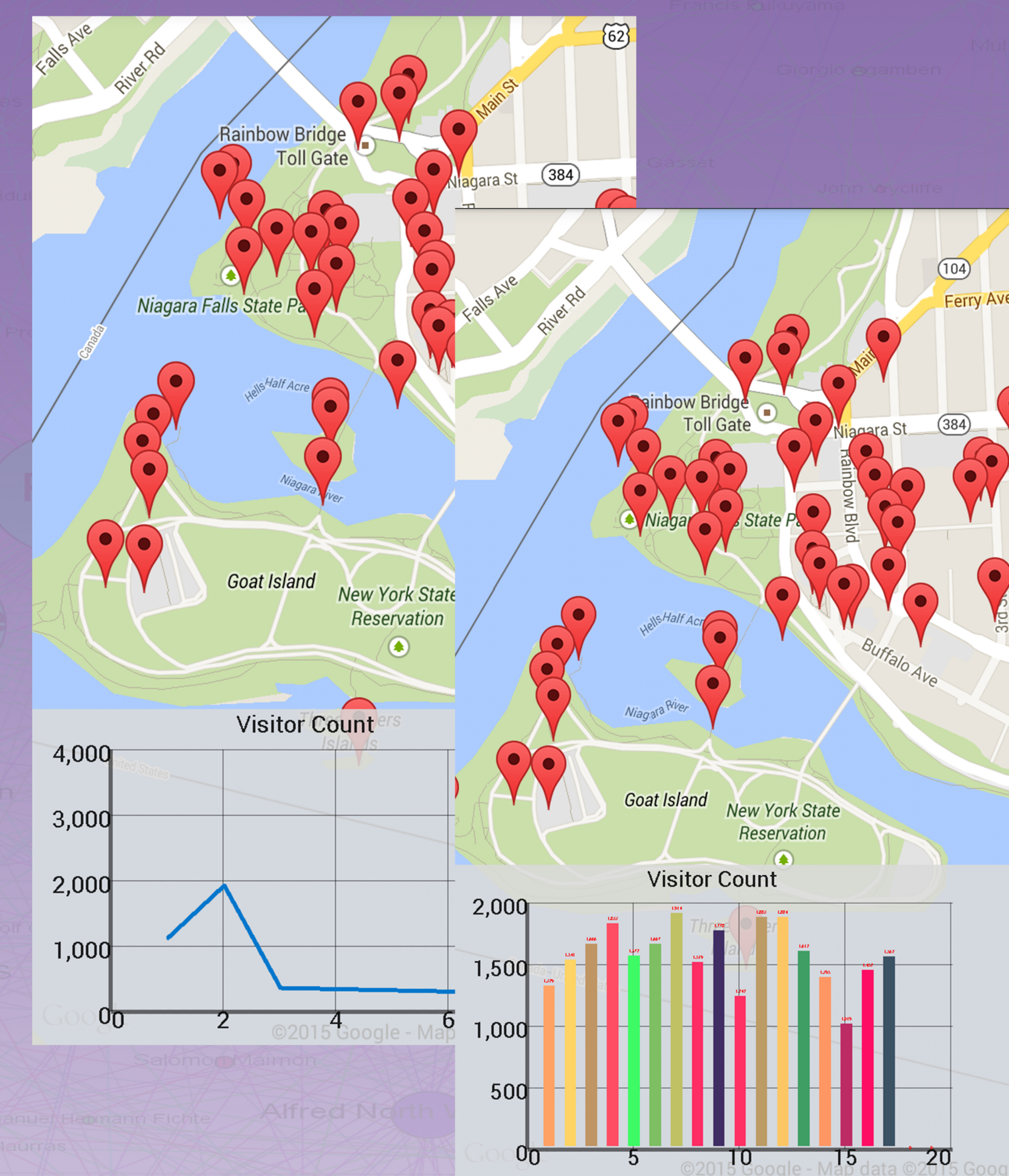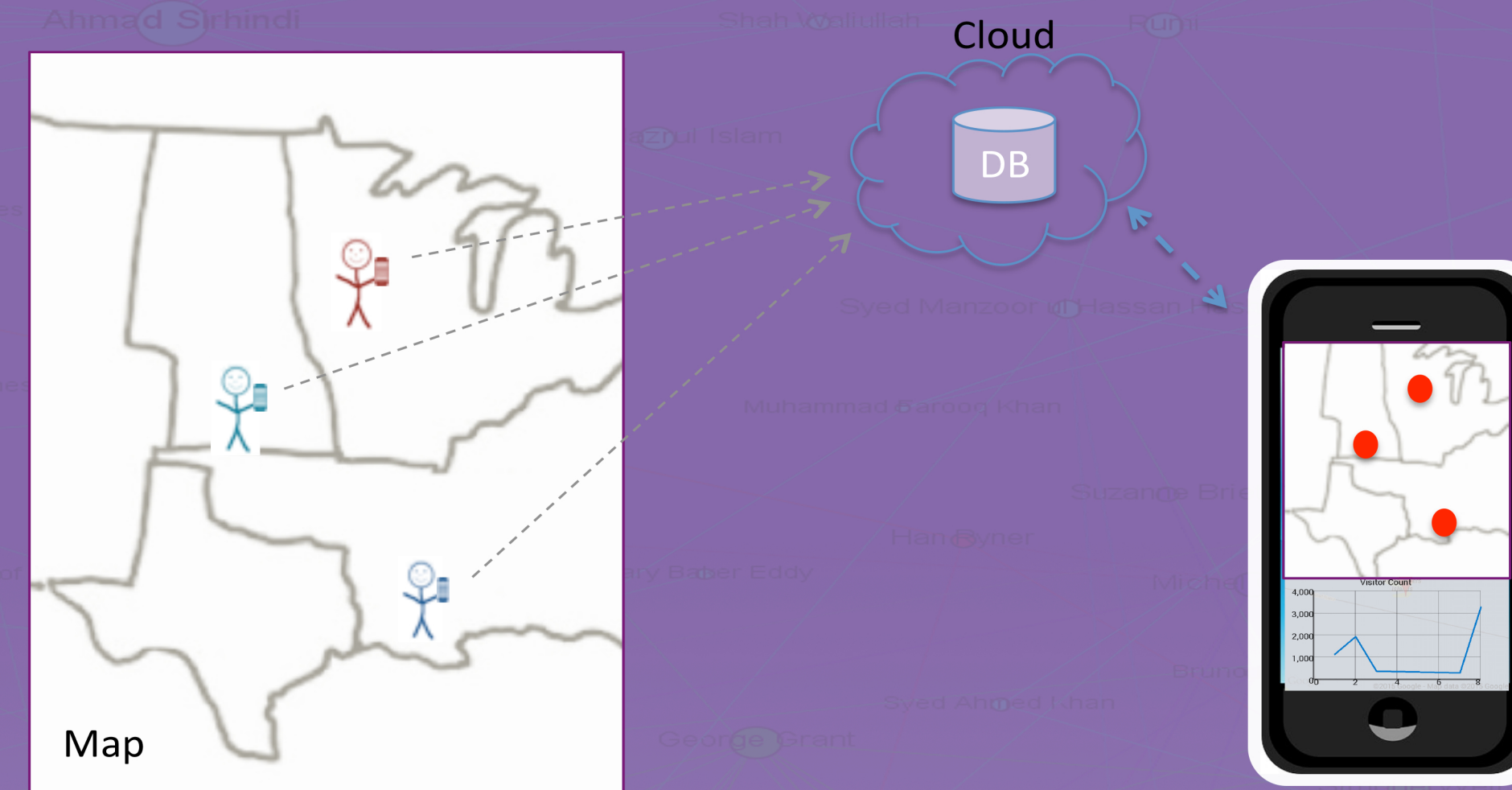
What we visualized?

There are millions of people who visit Niagara Falls every year. They upload pictures to their social media accounts such as Instagram, Facebook, or Twitter. When they do this, their location information will be automatically uploaded to the web server via their smartphone. (we will call as 'check-in'). There is a check-in based social media service named Swarm. It is integrated with other social media outlets. We monitor this check-in data provided by Swarm and visualize it.

Methodology

1. Create mobile application to fetch Niagara Falls' visitor data from Swarm servers.
2. Store the data on test mobile device.
3. Visualize the visitor's data using charts (line char, pie chart, bar chart).

image from; http://tiny.cc/31u3wx

Result

The screenshot has two parts, in the upper part, the icons stand for the places we monitored; in the lower part, there is the visualization, we use line chart to visualize the number of the visitors day-by-day. This app can fetch data, store data, retrieve data, manipulate data, and visualize data. Other types of chart, such as bar chart and pie chart, can also be used for visualizing those data. For the next step, we need a server, which runs our code continuously, and fetch data hourly. Since we do not have access to continuous data at other locations, we only included airport visitors, for now

Future Study

In the current study, the data are stored on a mobile device. Due to the limitation of storage, we cannot have continuous data. For a big-data application, Cloud Computing will be applied for storing continuous data. Another application will apply wearable technologies for visualization, such as by using Smart Watches and Smart Glasses. We will use VR (Virtual Reality) glasses in near future. 3D visualization on mobile devices is another research trend.

Another good example for visualization
image; http://tiny.cc/ruv3wx

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Creative Thinking Creative Learning

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