ISyE 2028 – Basic Statistical Methods - Fall 2015
Bonus Project: "Big" Data Analytics
Proposal

Georgia Tech Aquatic Center Oxidation Reduction Potential Statistical Analysis

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Abstract:
For many students at Georgia Tech, the Campus Recreation Center (CRC) is a staple of student life. Home to a vast workout facility, multiple recreational courts, and a state of the art aquatic center, the CRC is an iconic landmark on campus. Since its beginnings at the 1996 Olympics, the swimming pools at the CRC are notably a complex and impressive feat of engineering. Today the leisure pool, competition pool, and dive well house millions of gallons of water and serves thousands of students. To ensure the safety of the swimmers and quality of the water, certain chemicals must be introduced and monitored to kill bacteria and other harmful agents. Chlorine and Bromine are the chemicals of choice for the pools at the CRC. Oxidation reduction potential (ORP) measures the ability of chlorine or bromine to eliminate harmful agents. It is necessary to maintain ORP level to maintain the overall safety of the pool. This analysis will take a large sample of ORP readings from the three main pools and conduct a confidence interval on each to determine if the interval contains the set point at which the pool's ORP is supposed to be.

Measurements:
ORP – Oxidation Reduction Potential (millivolts)

Sample Data:
The ORP readings will be collected from the log books at the CRC. Everyday walkthroughs are conducted to collect current and accurate readings of multiple measurements of the pool. There will be 50 samples collected from 50 previous days of measurements.

Statistical Methods:
A two-sided confidence interval for a population with an unknown standard deviation will be conducted on the sample data. A confidence level of 95% will be used. I plan to use Excel and graphing technology to compute interval and illustrate trends. The conclusion from the confidence interval will show if many samples were taken from each pool, 99% of the time the true mean will fall within the interval. The set point can be compared to the interval to determine if the true mean is actually within the interval.

Results:
I expect the results to generate an interval that will not contain the true set point. The ORP is constantly fluctuating and might not give an interval that would contain the true set point 95% of the time.