

CONSULTING EXPERIENCE

LUCAS ROBERTS

Sonification survey: Can we use sound as an means of communication to computer programmers? This study was conducted by a graduate student in the computer science dept to determine if programmers could understand information conveyed through sound indicating the amount of CPU usage in a program for code optimization.

Statistical technique(s) used: Linear Regression.

Variation of volatile profiles from ecotypes of the model plant Arabidopsis thaliana:

This project was to understand the chemical process underlying two substrates within the plant Arabidopsis thaliana.

Statistical technique(s) used: Principal Components Linear Regression.

A study of teacher experiences during a renovation project: This project was to determine if the physical conditions of a school has impact on the learning outcomes of students. The study tried to illustrate the effect of changing the physical setting of a school and how that affected standardized testing outcomes. This was actually two projects because school renovations were occurring in two school districts within the county. Both students have since successfully completed the dissertation defenses and are working as principals at their respective schools.

Statistical technique(s) used: Linear Regression, non-parametric tests (Kruskal-Wallis).

An Examination of the Effectiveness of Sanction Based Tax Compliance

Persuasive Messages over Repeated Periods: This was a experimental study of the willingness of people to be truthful about their income when filing tax returns. The study was a computer simulated game where participants make money doing various tasks and then asked to report income.

Statistical technique(s) used: Time series, AR(k), MA(k), variable selection.

Wearable Pulse Oximetry in Construction Related Tasks: This study aimed to set a probability inequality on a wearable device (a hardhat) to monitor the carbon monoxide exposure level of employees to improve working conditions for construction personnel. The problem was construction workers are in a shaky environment making the oximeters

subject to interference. We wanted to show the probability of consistent interference for more than 5 minutes was less than 0.01.

Statistical technique(s) used: Stochastic processes (Gamma), MVUE's, distributional tests (Kolmogorov Smirnov).

Understanding differences in inferred generation of media (and effect of age): This study aimed to clarify the ambiguity of the timing of so-called digital natives. Survey data was collected and analyzed to determine an appropriate starting date for digital natives as several years have been proposed.

Statistical technique(s) used: Factor Analysis, descriptive statistics, regression methods.

Wine production and quality: This study (currently ongoing) is to determine the effect of several cover crops (grasses) and root pruning on the water content of soil. We want to know whether this directly effects the quality and chemistry of grapes used in wine production. We are also studying the impact on different nematodes (worms) in the soil. The study is done in conjunction with Surrey County community college wine production and Dobson Vineyards (both in North Carolina).

Statistical technique(s) used: Mixed models, Split plot design, Zero inflated Poisson and Negative binomial models, AR(k) models.