

# Pi Mu Epsilon Student Talks

May 1, 2011



## 1. **Heip Ngueyn** - *Roller Derby*

Have you ever wondered which would roll faster (neglecting friction), a ball or a cylinder? What if they are hollow? In this presentation we will rate the four choices. To compute the inertia moments involved we use multivariate integrals.

## 2. **Melissa Guse** - *Way Harder Than Fly Fishing: Comparing the means of two populations*

It is a common practice in statistics to estimate unknown values of populations from the randomly drawn samples. One such problem is to estimate the difference of the means of two populations. This problem becomes challenging when the populations have unknown and unequal variances. Many solutions have been proposed. I will discuss one such existing solution and offer ways of improving it.

## 3. **Brad Moss** - *A New Approach for Comparing the Means of Two Populations*

Estimating the difference between unknown means of two independent populations is a very useful project in many fields of study, such as medicine, engineering, business and education. Some standard methods exist. However the existing methods are valid only when two populations have known variances, or unknown but equal variances. In practice these conditions hardly ever apply. Many authors have discussed the alternative methods under these conditions. In this paper we have suggested a new, easy to apply solution to this problem. What sets our proposed solution different from all other solutions is that we consider the estimation of the ratio of two means rather than the difference.

## 4. **Garret Marshall** - *Generalized Estimating Equations and Quasi-Least Squares*

Generalized estimating equation approach (GEE) is one of the popular methods in longitudinal data analysis. However, there is no guarantee the GEE estimate of a correlation matrix is positive definite and sometimes it may also have a convergence problem. In this talk, an example using transformed dependent variables is presented and the convergence problem is overcome using the Quasi-least square method, which guarantees that the estimate of correlation matrix is positive definite.