June 25, 2003

Personal Statement

1. *Reasons I want to do graduate work in this field.*

Statistics is an extremely interesting and useful field as it is a means by which we can further our understanding of the world. In fact, almost every decision we make is based on a (relative) likelihood which we loosely derive from our current understanding of the state of the world.

I have had positive research experiences with my thesis advisor and members of the National Center for Health Statistics (NCHS), where I am interning during the Summer of 2003. This, along with interesting coursework, has motivated me to continue into a Doctoral program in statistics.

I wish to contribute my talents to the application of statistical analysis and the development of new statistical methods in areas that improve the conditions of life. To fulfill this goal, I must be engaged in basic statistical research including mathematical statistics and probability theory.

2. *My specific interests and experiences in this field.*

My interests are still wide and malleable. Some that have grabbed my attention recently include Bayesian hierarchical models and simultaneous inference, which I have been using extensively in my master's thesis. Areas I wish to explore include using Hidden Markov Models and Bayesian Networks to model aspects of my outside interests of Dance and Music.

I am the second author of a paper written with my thesis advisor, Dr. Balgobin Nandram[1], during the winter of 2002/2003. The paper is currently under peer review with the title, "Alternative Methods for Fitting Two-Stage Hierarchical Bayesian Models", which suggests the Sampling/Importance Resampling (SIR) algorithm as a fast alternative to popular Markov chain Monte Carlo (MCMC) methods in a Poisson Regression setting. My role was primarily in writing and running programs (in Fortran) to emulate the models and in assisting writing the text.

In addition to my thesis, I'm currently working on a paper with Dr. Balgobin Nandram and Dr. Jai Choi, of the NCHS, on Bayesian nonignorable nonresponse models.

[1]Dr. Balgobin Nandram is an American Statistical Association (ASA) Research Fellow and WPI Professor with a webpage at http://users.wpi.edu/~balnan

All of my Graduate class projects can be found at my website[2]. Two projects are most notable. The most recent project uses Quality Control and Reliability methods to determine the effect of oil in a latex condom water burst test. A project from my first semester uses Response Surface Analysis methods to maximize the flight time of a paper helicopter. For both of these projects I designed and conducted the experiments as well as performed all statistical analyses.

In my NonParametric statistics class (WPI catalog MA552) I wrote my own software[3] in MatLab to construct the statistics, perform tests, construct confidence intervals and perform other necessary procedures.

3. *Any special skills or experiences that may relate to an assistantship.*

As of graduation from my current master's program at WPI in December, 2003, I will have performed my duties as a Teaching Assistant in Statistics I and II (WPI catalog MA2611 and MA2612) for eight undergraduate classes. My primary duty in this role is to (sometimes author and) conduct labs in which the students are given the opportunity to apply the methods they have learned in the lectures to real data. Both SAS-based and web-based labs are used on the computer. Additional duties include holding weekly office hours, and grading labs, homework, and in-class performance measures. I often go beyond what is asked of me by offering tutoring and special test/exam preparation sessions.

I have experience with many softwares and programming languages useful for mathematics and statistics. These include SAS, S-plus, MatLab, Maple, ASTSA, Fortran, C++, BASIC and LaTeX 2_ε. Additionally, I'm familiar with several flavors of unix, PC DOS, Windows, and VAX operating systems.

My teaching dossier[4] is a living and condensed record of my teaching activities and accomplishments as well as my philosophy and practices. I began this collection of documents during the Seminar In College Teaching, offered summer session 2002 (WPI catalog IDG501).

[2]Graduate class projects under Research at http://erike.unicyclist.com

[3]Nonparametric Statistics MatLab toolbox under Research at http://erike.unicyclist.com

[4]Teaching Dossier under Dossier at http://erike.unicyclist.com

4. *My career plans.*

As I imagine my career plans today, they include research, teaching and consulting in the Pioneer Valley. The UMass Doctoral program should clarify my specific research interests so that I can get my research going soon after I complete. My current sights are set on using Hidden Markov Models and Bayesian Networks to model aspects of Dance and Music. I expect to teach undergraduate and graduate classes to refine my knowledge and serve the academic community in an immediate way. This may include project planning and advising as a way to get students active in the research process. As I refine my skills I would like to serve others in the research community as a consultant, particularly in other disciplines where statistical methods are relied upon but might be misused or where improved methods are unknown.