

# Department of Statistics



NORTH DAKOTA STATE UNIVERSITY

SUMMER 2014

## SPECIAL POINTS OF INTEREST

- Spring 2013-  
Spring 2014  
Graduating  
Students
- Statistics  
Scholarship  
Recipients
- Faculty/Staff of  
the Department
- Bracketing  
Basketball Games  
Using Statistical  
Modeling
- Red River Valley  
Statistical  
Conference
- Artwork for the  
Department

## FACULTY & STAFF

Dr. Rhonda Magel

Dr. Ron Degges

Dr. Seung Won Hyun

Dr. Megan Orr

Dr. Tatjana Miljkovic

Dr. Gang Shen

Dr. Yarong Yang

Dawn Halle

## SPRING 2013-SPRING 2014 Graduating Students

### Bachelor of Science-Statistics

Matthew Lobitz  
Kristen Tomanek  
Michael Hanson  
Norifumi Kimura  
Deanna Schreiber-Gregory  
Joseph Ching  
Robert Durham  
Bryan Rask  
Patrick Bjerke  
Scott Haws  
Scot Jones

### Bachelor of Science-Behavioral Statistics

Caitlin Deal  
Stephanie Nelson

### Minor-Statistics

Michelle Full  
Brianna Rindy  
Logan Boe  
Austin Wiger  
Dienul Paramarta  
Christopher Adducci

### Certificate- Statistics

Christopher Kuylen  
Melinda Fangman  
Shah Limon  
Qing Liu  
Albert Kertho  
Juan Vargas-Ramirez  
Laura Farrell

### Master of Science-Applied Statistics

Jessica Carter  
Di Huang  
Jamie Kubat  
Joseph Long  
Yana Melnykov  
Joseph Roith  
Samuel Unruh  
Xiao Zhang  
Ruifeng Liu  
Michael Hoffman

### Doctor of Philosophy-Statistics

Tatjana Miljkovic  
Karl D'Silva  
Alfred Ndungu

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## HP Kuang Scholarship

The Department of Statistics awarded Amy Crawford and Presley Glaser the 2013-2014 H.P. Kuang Scholarship. Eugene Stepan and Taylor King were awarded the 2014-2015 HP Kuang Scholarship. Congratulations to all awardees! Recipients are selected by a committee in the department based on their statistics courses they have taken and GPA at NDSU. They have all excelled in the area of statistics.

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**\*\*Please Note: The Department of Statistics has moved.**

**We are now located on the 2nd floor of Morrill Hall, Suite 221.**

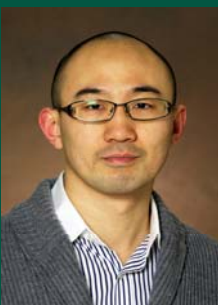
Dr. Rhonda Magel  
Department Chair



Dr. Ronald Degges  
Assistant Professor of Practice



Dr. Seung Won Hyun  
Assistant Professor



## Welcome from the Chair

As I am writing this, the 2013-14 academic year has ended at NDSU. Overall, I am impressed with the performance of our undergraduate and graduate student majors, both in classes and in research that was conducted. The 4th annual Red River Valley Statistical Conference was held on April 30th, 2014. There were 16 students giving oral presentations and 12 students giving poster presentations. Dr. Megan Orr and Dr. Yarong Yang gave the 2 keynote addresses. In this newsletter, we are including the list of presentations for the 4th Annual Red River Valley Statistical Conference. Great job students!!!

Seven of my students and I have had research papers accepted this past year. These include the following: "Identifying Significant In-Game Statistics and Developing Prediction Models for Outcomes of NCAA Division I Football Championship Subdivision (FCS) Games", in *Journal of Statistical Science and*

*Application* with Joe Long; "Does Football Momentum Translate into Points?", in *International Journal of Sports Science and Engineering*, with Michael Price; "An Analysis of Factors Contribution to Wins in the National Hockey League", in *International Journal of Sports Science* with Joe Roith; "Examining Influential Factors and Prediction Outcomes in European Soccer Games", in *International Journal of Sports Science* with Yana Melnykov; "Nonparametric Tests for Ordering in Completely Randomized and Randomized Block Mixed Designs" in *International Journal of Biometrics and Biostatistics* with Alfred Ndungu; "Determining Factors Influencing the Outcome of College Basketball Games", in *Open Journal of Statistics* with Sam Unruh; and "A Proposed Test for a Mixed Two-Sample Design: in *Journal of Statistical Theory and Practice*..

I continue to love being part of the FM community and NDSU, despite the long winter that we all just experienced. Some of the highlights of this past year

included the great performances of the NDSU athletic teams and clubs. Go Bison!!! I attended the musical "Sweeney Todd" at Festival Concert Hall in February, an NDSU theater production. The talent of those involved was impressive. On March 1st, when it was 20 degrees below zero at 9 in the morning, I got to take part in the first annual run around the dome half marathon-it was 42 times around the course of the dome for the half-marathon and I was quite comfortable running in shorts and a tank top. The weather for the 10th annual Fargo Marathon was great. I enjoyed being able to participate in both the 5K and Marathon, starting at the Main Ave. Bridge and ending at the Fargo theater. The crowd support in Fargo was wonderful! I did one relay race in Finley with my son. My daughter and I also did the "Run or Dye" 5K race.

Have a great summer!!! Congratulations to all of our graduates. If you have left NDSU, please keep in touch.

## Dr. Ron Degges, Assistant Professor of Practice

In Fall 2013 I taught Stat 460/660, Survey Sampling. For the non-majors I have taught STAT 725 and 726 both online. I have been coordinating the graduate teaching assistants in both the Stat 330 lecture classes and the lab times. I have served on 4 M.S. and 2 Ph.D. committees the past

year. For Fall 2014 I have been approved and received funding to have 4 undergraduate students come into Stat 330 lecture as Learning Assistants. These students will help the students enrolled in the class to learn how to apply statistics to real problems. In early August, I will be going

to the University of North Carolina at Asheville to attend a conference with Dean Wood and four other faculty members. The conference is called SENCER (Science Education for New Civic Engagement and Responsibilities). I was invited to attend this conference where I can learn about new education techniques.

## Dr. Seung Won Hyun, Assistant Professor

Dr. Seung Won Hyun is currently working on multiple collaborative research projects. The first one is research work with Dr. Weng Kee Wong at the University of California at Los Angeles about Multiple-Objective Optimal Designs for the 4-Parameter Logistic Model.

The second one is developing an R package for finding multiple objective optimal designs. This is a joint work with Dr. Yarong Yang. The third one is research work with Dr. Hongjian Zhu at the University of Texas Health Science Center at Houston about Covariate-Adjusted

Response-Adaptive Designs Considering Efficiency and Ethics to Detect Treatment-Biomarker Interaction. The corresponding research papers will be submitted soon to peer-reviewed journals.

## Dr. Megan Orr, Assistant Professor

My second year at NDSU has been very busy! In Fall semester 2013 I taught a new course, MPH 731, which is a required biostatistics course for students in NDSU's Master of Public Health program. I am also working on many collaborative projects with MPH faculty members, including an NIH grant proposal involv-

ing secondary analyses of alcohol and other chronic diseases. I have one manuscript, titled, "An Improved Method for Calculating Q-values when the Distribution of Effect Sizes is Asymmetric," currently under revision for *Bioinformatics*, and am preparing another manuscript involving identification of genes

that are differentially expressed in both or two experiments for submissions to another peer-reviewed journal. On a more personal note, my husband, Brad, and I got married in July and we bought our first house in November. Very exciting!

Dr. Megan Orr

Assistant Professor



## Dr. Gang Shen, Assistant Professor

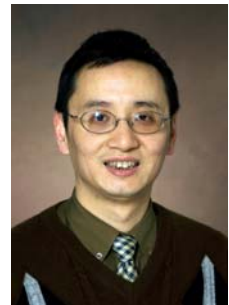
In 2013, my two research papers on the topic of change-point problem got published and two of my two M.S. students graduated. Currently, I am work-

ing with my two Ph.D. students on the topic of isotonic change-point problem and change-curve detection problem. I have also been collaborating with other

researchers in the area of scientific computation, economic recession prediction and sport statistics.

Dr. Gang Shen

Assistant Professor



## Dr. Yarong Yang, Assistant Professor

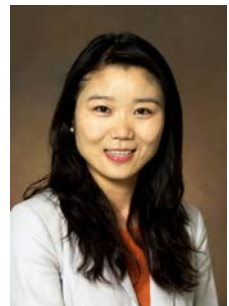
Dr. Yarong Yang joined the department in August 2012. Her research directions mainly focus on bioinformatics and geostatistics. Recently she submitted two papers for publication to present her joint work with researchers in other de-

partments of NDSU and a pharmaceutical company. Dr. Yang is mentoring three master students in statistics and serving as dissertation committee member for several graduate students from other departments.

Dr. Yang travels frequently for work, pleasure, and self-enlightenment. She also takes ballroom dance as routine exercise. In her spare time, she enjoys hanging out with friends for shopping, dining, and conversations.

Dr. Yarong Yang

Assistant Professor



## Dawn Halle, Academic Assistant

This past year has been another busy one. The department has settled into our Morrill Hall offices now. I am currently working on getting our 4th Annual Red River Valley Statistical Conference organized. There is

a lot of work that goes into this by everyone and it is worth all the effort. It is a great experience for our students.

At home, my 3 children keep me busy too. Parish

(16) is involved in band and track; Savanna (14) is involved with volleyball and dance; and Isaac (10) is involved in basketball, judo and Cub Scouts.

Dawn Halle

Academic Assistant



***"When one door of happiness closes, another opens; but often we look so long at the closed door that we do not see the one which has been opened for us." —***

***Helen Keller***

Dr. Tatjana Miljkovic  
Assistant Professor of  
Practice



## Dr. Tatjana Miljkovic, Assistant Professor of Practice

I want to express appreciation to my advisor Dr. Megan Orr who was instrumental in expediting my dissertation project and making it possible for me to defend in May of 2013. Since I was promoted to Assistant Professor of Practice, I have been working on several research projects collaborating with faculties from other departments and chairing M.S. theses in actuarial science area. My graduate students plan to present their projects at ND EPSCoR/IDeA 2014 conference in Grand Forks. This spring, I enjoy teaching a graduate level course "Probabilistic and Deterministic Methods" (ENGR 771/IME 701) in the Industrial Engineering Department.

Picture to the right.  
Statistics students at the  
2014 ND EPSCoR/IDeA  
Conference in Grand Forks.  
Pictured from left to right:  
Dr. Tatjana Miljkovic,  
Taryn Chase, Michael  
Hoffman, Joshua Nelson,  
Christopher McEwen, Dr.  
Yarong Yang, Peter  
Martin, Qi Wang, and  
Qiang Li



## Bracketing Basketball Games Using Statistical Modeling

Dr. Gang Shen, Yingfei Wang, Bryan Rask, and Dr. Rhonda Magel were involved in developing linear and conditional logistic regression models to predict the outcomes of basketball games during Men's March Madness 2014. Some of this was an extension of work done by Xiao Zhang, a 2013 M.S. graduate working with Dr. Shen. Their bracket ended up with 68% of the games predicted correctly which was good considering the number of close games.

Wenting Wang and Dr. Rhonda Magel developed models to predict the 2014 Women's March Madness. Their bracket had 76.12% of the games predicted correctly, which included predicting the final four teams, the two teams making it to the championship game, and the overall winner.

Scot Jones, a McNair scholar, and Dr. Rhonda Magel were also involved with developing linear regression models for bracketing the NBA playoffs for 2014. As of this writing, their bracket has done extremely well and has predicted the final two teams in the championship series. They will have to wait through 7 or fewer games at this point to determine if they correctly predicted the champion based on their statistical models.

# Red River Valley Statistical Conferences Held

The Department of Statistics at NDSU hosted the Fourth Annual Red River Valley Statistical Conference on April 30, 2014. Dr. Megan Orr and Dr. Yarong Yang were the keynote speakers. Dr. Orr also served as the conference proceedings editor; Dr. Gang Shen, Dr. Tatjana Miljkovic, Dr. Yarong Yang, Dr. Ron Degges and Dr. Seung Won Hyun served as session chairs and/or helped with the conference. Dawn Halle coordinated the food and the rooms. Several students made posters on their research for the conference and others gave talks.

## The Fourth Annual Red River Valley Statistical Conference Presenters

Presenter	Title
Mohamed Sylla	Prediction of 2014 World Cup Soccer Winner
Scot Jones	Predicting Outcomes of NBA Basketball Games
Wenting Wang	A Predictive Model of Division I Women's College Basketball
Bryan Alan Rask	March Sanity: Predicting the March Madness Tournament Using Least Squares Regression
Dr. Megan Orr (Keynote)	Identifying Genes that are Differentially Expressed in Both of Two Independent Experiments
Dr. Yarong Yang (Keynote)	Test Equality of Curves with Homoscedastic or Heteroscedastic Errors
Kayéromi Gomez	Multiple Comparisons in Experimental Designs with Large Numbers of Treatments: An Assessment of the Performance of the False Discovery Rate and Dunnett's Test
Ekuá Bentil	Identification of Differentially Expressed Genes and Gene Sets taking into Consideration the Distribution of Effect Sizes in Microarray Analysis
Yue Ming	T-Optimal Designs for Model Discrimination in Probit Models
Anqing Zhang	Robust C-Optimal Design for Estimating the EDp
Michael Hoffman	An Analysis of Salary for Major League Baseball Players
Shane Loeffler	Cluster Analysis Comparison for Ellipsoidal Data
Yingfei Mu	Boundary Estimation
Jennifer Johnson	Difference in Proportions for Men and Women Running Marathons
Susan Olet	Proposed Nonparametric Tests for the Simple Tree Alternative in a Mixed Design
Karl D'Silva	Two Approaches to the Isotonic Change-Point Problem: Nonparametric and Minimax
Sudhi Upadhyaya	Comparison of Classification Probabilities among Logistic Regression, Neural Network and Support Vector Machines in the Presence of Missing Data
Alfred Ndungu	Nonparametric Test for the Non-Decreasing and Umbrella Alternatives in the Incomplete Block and Completely Randomized Mixed Design
Poster	Title
Taryn Chase, Peter Martin & Tatjana Miljkovic	Loss Triangles
Joshua Hugen, Michael Hoffman & Tatjana Miljkovic	K-Component Mixture Modeling
John Lauman-Beltz	A Multiple Regression Analysis of McDonald's Sandwich Serve Times, Sandwich Counts, Drive-thru Sales, Cars Served
Christopher McEwen & Yarong Yang	Utilizing the Local Outlier Factor Algorithm as a Refinement Tool for Classification Models
Purbasha Mistry	The Effect of Temperature and Precipitation on the Yield of Spring Wheat in North Dakota
Partheeban Selvarajah	Statistical Analysis of Settlement and Rotation of Rocking Shallow Foundations from Centrifuge and Shake Table Experiments
Achintyamugha S. Sharma	Dispersion of Carbon Nanotubes in Aqueous Solutions
Suvash Shiwakoti	Evaluation of Quantitative PCR (qPCR) with Propidium Monoazide (PMA) for the Specific Detection of Live <i>Listeria Monocytogenes</i> in Soil
Qi Wang, Yarong Yang & Bin Guo	Using Impute MicroRNA Regulation Based on Weighted Ranked Expression and Putative MicroRNA Targets to Select MicroRNAs for Predicting Prostate Cancer Recurrence

# Artwork Created for Statistics Department

A student majoring in art at NDSU, Jonathan Bell-Clement, worked with the Department of Statistics in Spring 2014 and developed drawings that represent the various research areas of the department. His drawings are below. Drawing 1 represents sports statistics. Drawing 2 represents sta-

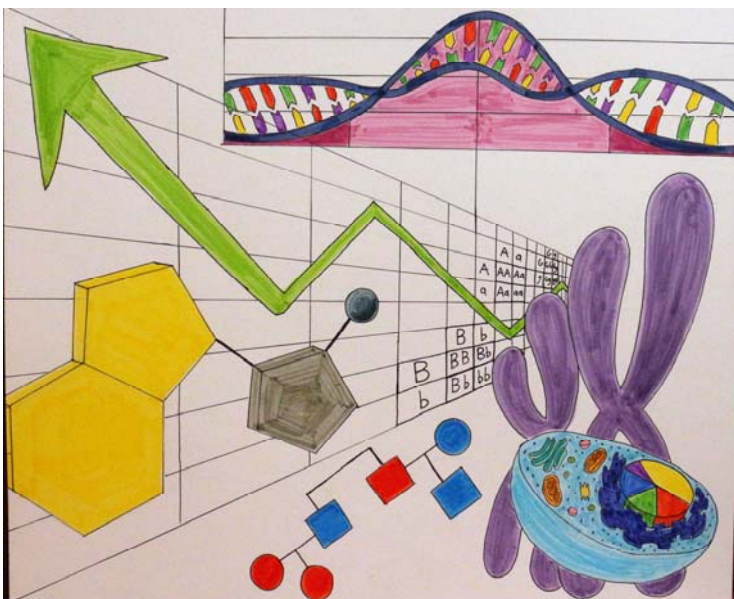
tistical genetics, biostatistics and bioinformatics. Drawing 3 represents time series, nonparametrics, and actuarial science. Drawing 4 is our logo.

*"We all need someone who inspires us to do better than we know how."— Anonymous*

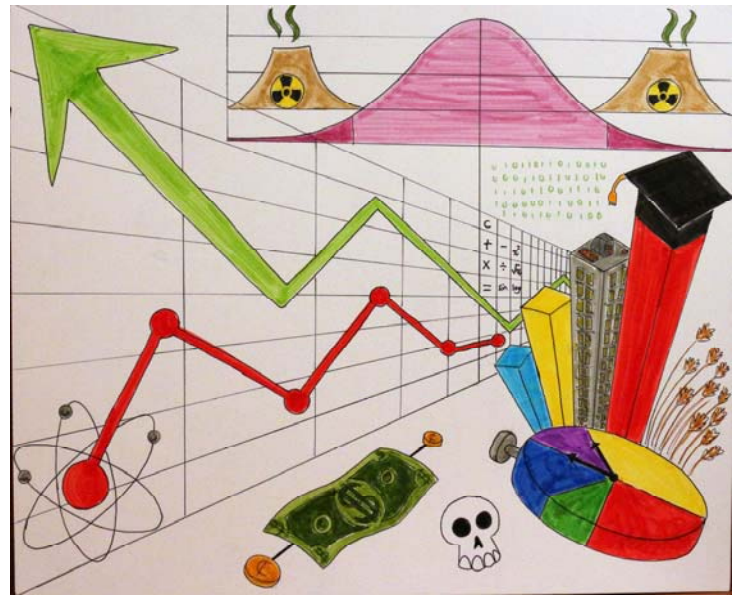
1.



2.



3.



4.





Pictures above are from some of the different things happening here in the department.

The Department of Statistics wishes to thank all donors who have contributed to our scholarship programs and to the department. You are making a significant difference in the lives of our students and to North Dakota State University. If you would like to make a donation, please visit <https://www.ndsualumni.com/donate>. When donating, select other and designate Department of Statistics.

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corrections/updates to  
[dawn.halle@nds.edu](mailto:dawn.halle@nds.edu) or call  
Dawn at 701-231-7532

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