# Manju M. Johny

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## Education

**Doctor of Philosophy in Statistics** — *Ames, IA*
Iowa State University — *May 2020 (Expected)*

**Master of Science in Statistics** — *Ames, IA*
Iowa State University — *May 2017*

**Bachelor of Arts in Chemistry and Mathematics** — *St. Louis, MO*
Saint Louis University — *May 2014*

## Skills

**Programming** R, JMP, Excel (fluent); Python, MATLAB, JAGS, SAS (familiar)
**Typesetting** LaTeX(fluent)
**Hardware** Raspberry Pi (familiar)
**Spoken** English, Malayalam (fluent); Spanish (familiar)
**Other** Effective public speaker with excellent teaching evaluations; strong scientific background; creative and excited to learn

## Honors & Awards

### International

2016 **Second Place & Fifth Place**, Prudsys Data Mining Cup — *Berlin, Germany*

### Domestic

2014 **Alumni Fellowship**, Iowa State University — *Ames, IA*
2013-14 **ORISE Fellowship**, Oak Ridge Institute for Science and Education; US FDA — *St. Louis, MO*
2014 **Pi Mu Epsilon Member**, US National Mathematics Honor Society — *St. Louis, MO*
2013 **Dean's List**, Saint Louis University — *St. Louis, MO*
2010-14 **Vice President's Scholarship**, Saint Louis University — *St. Louis, MO*
2010-14 **Bright Flight Scholarship**, Missouri Department of Higher Education — *St. Louis, MO*
2010 **Advanced Placement Scholar with Distinction**, The College Board — *St. Louis, MO*
2009 **Second Place (Tech Challenge)/Boeing Team Grant**, FIRST Robotics Competition — *St. Louis, MO*
2007 **Most Improved Player**, Tennis Club — *St. Louis, MO*

## Research

**Extensions to Functional Anova Methodology** — *Ames, IA*
**PhD Dissertation (in progress), Iowa State University** — *2017-present*
Mentor: Petruţa Caragea, Ph.D

- Extended functional anova methodology through development of algorithm to test for interaction between treatments for groups of time series curves. Applied algorithm to understand interaction between treatments that simulate different consequences of climate change on soil moisture and temperature.
- Developed a method for creating novel visualizations of the functional anova tests, which provide an additional facet to understanding the significance of the tests, and allow for identification of when significant differences and interactions occur over time.

**Functional Anova Approach to Detect Changes in Soil Moisture and Temperature** *Ames, IA*

**Master's Creative Component, Iowa State University** *2016-17*

Mentor: Petruţa Caragea, Ph.D

- Utilized a functional anova approach to study the effects of experimentally simulated climate change on soil moisture and temperature. Approach involved smoothing multiple groups of time series curves using Fourier and b-spline basis, and using a parametric bootstrap procedure to test equality of mean curves.
- Successfully defended Master's Creative Component on May 10, 2017.

**Research Fellow** *St. Louis, MO*

**DPA/CDER/US Food and Drug Administration.** *Summer 2014*

Mentors: Jason Rodriguez, Ph.D; Connie Gryniewicz-Ruzicka, Ph.D

- Developed an algorithm in MATLAB to transfer laboratory methods to field instruments.
- Developed rapid screening methods to identify adulteration of pharmaceutical materials on bench top and portable Ion Mobility Spectrometry instruments.
- Research culminated in a formal talk to Department of Pharmaceutical Analysis, CDER/FDA.

**Research Fellow** *St. Louis, MO*

**DPA/CDER/US Food and Drug Administration.** *Summer 2013*

Mentors: Jason Rodriguez, Ph.D; Hongping Ye, Ph.D

- Utilized statistical methods for disaccharide analysis to test for ruminant contamination in heparin.
- Developed Raman and near Infrared spectral libraries for screening of pharmaceutical materials.
- Research culminated in formal talk to Department of Pharmaceutical Analysis, CDER/FDA, and poster presentation at Center for Drug Evaluation and Research Science Day in White Oak, MD.

## Publications & Presentations

### Publications

- Johny, M. M.; Caragea, P.; Debinski, D. M.; Sherwood, J. A Functional Anova Approach to Detecting Changes in Soil Moisture and Temperature. (In Preparation)
- Vaziri, G. ; Johny, M. M.; Caragea, P.; Adelman, J. S. Social Context Affects Thermoregulation but not Locomotor Activity During Immune Challenge in a Social Passerine. (In Preparation)
- Rodriguez, J. D.; Skaggs, S.K.; Johny, M. M.; Srivastiva, H.K.; Loethen, Y.L.; Arzhantsev, S.; Kauffman, J. F.; Buhse, L.F. Distribution of Spectral Libraries Across Different Field Deployable Raman and Near Infrared Instruments. *Am. Pharm. Review* **2014**, 17, 10-17.

### Poster Presentations

- Manju M. Johny, Petruta Caragea, Diane M. Debinski and Jill Sherwood, "A Functional Anova Approach to Detecting Changes in Soil Moisture and Temperature" Joint Statistical Meetings, Vancouver, British Columbia; Jul. 2018 (To be presented by me)
- Jason D. Rodriguez, Steven K. Skaggs, Manju M. Johny, Hirsch K. Srivastava, and Yvette L. Loethen, "Evaluating the Performance of Field Screening Using Portable Raman and Near Infrared Spectrometers" IFPAC Conference; Feb. 2015. (Presented by Jason D. Rodriguez)

### Oral Presentations

- Iowa State University Team 1 (Abhishek Chakraborty, Ye Han, Manju M. Johny, Xinyi Li, Xiaojun Mao, Haozhe Zhang), "Data Mining Cup Solution" Prudsys Personalization Summit, Berlin, Germany; July 2016. (Presented by me)
- Manju M. Johny, Steven K. Skaggs, Connie M. Gryniewicz-Ruzicka, Jason D. Rodriguez, "Development of IMS Library for Detection of Adulterants; Standardization of Raman Spectra Across 5 Different Instruments" FDA Summer Research Symposium, St. Louis, MO USA; Aug 2014. (Presented by me)
- Manju M. Johny, Hongping Ye, "Disaccharide Analysis to Test Ruminant Contamination of Heparin" FDA Summer Research Symposium, St. Louis, MO USA; Aug 2013. (Presented by me)
- Jason D. Rodriguez, Steven K. Skaggs, Manju M. Johny, Sergey Arzhantsev, Yvette L. Loethen, Hirsch K. Srivastava, John F. Kauffman, and Lucinda F. Buhse, "Developing Spectral Libraries for Domestic and Foreign Screening of Pharmaceutical Materials" CDER Science Day; White Oak, MD USA; Sept 2013. (Presented by Jason D. Rodriguez)

## Teaching

### Instructor

2015-18 **STAT 101: Principles of Statistics**, Iowa State University *Ames, IA*

### Lab Instructor

2014-15 **STAT 101: Principles of Statistics**, Iowa State University *Ames, IA*

### Grader

2014-15 **STAT 104: Introduction to Statistics**, Iowa State University *Ames, IA*
2015 **STAT 401: Statistical Methods for Research Workers**, Iowa State University *Ames, IA*

### Tutor

2013-14 **Statistics Tutor**, Saint Louis University *St. Louis, MO*
2010 **Professional Mathematics Tutor**, Jefferson College *Hillsboro, MO*

## Activities & Community Outreach

2014-16 **Iowa State STATers**, Iowa State University *Ames, IA*
2012-13 **Chemistry Club; Position: Demonstration Captain**, Saint Louis University *St. Louis, MO*
2008-13 **Volunteer**, Sunrise Assisted Living *Des Peres, MO*
2013 **Lion's Club International; Vision Screening Community**, Saint Louis University *St. Louis, MO*

## Graduate Courses

- STAT 500: Statistical Methods I (Using R, SAS) . . . . . *Fall 2014*
- STAT 510: Statistical Methods II (Using R) . . . . . *Spring 2015*
- STAT 520: Statistical Methods III (Using R) . . . . . *Fall 2015*
- STAT 601: Advanced Statistical Methods (Using R) . . . . . *Spring 2017*
- STAT 611: Theory & Application of Linear Models . . . . . *Fall 2016*
- STAT 542: Theory of Probability & Statistics I . . . . . *Fall 2014*
- STAT 543: Theory of Probability & Statistics II . . . . . *Spring 2016*
- STAT 641: Foundation of Probability Theory . . . . . *Fall 2016*
- STAT 642: Advanced Probability Theory . . . . . *Spring 2017*
- STAT 551: Time Series Analysis (Using R, ITSM) . . . . . *Fall 2015*
- STAT 534: Ecological Statistics (Using R, JAGS) . . . . . *Fall 2015*
- STAT 544: Bayesian Statistics (Using R, JAGS) . . . . . *Spring 2016*
- STAT 615: Advanced Bayesian Methods (Using R, JAGS, STAN, Rcpp (integration of R and C++)) . . . . . *Fall 2017*
- STAT 546: Non-parametric Methods in Statistics . . . . . *Fall 2017*
- STAT 579: An Introduction to R (Using R, SQL) . . . . . *Fall 2014*
- STAT 580: Statistical Computing (Using R, C) . . . . . *Spring 2015*