Manju M. Johny

1214 Florida Avenue, Unit 110, Ames, IA 50014

(314) 489-6078 | mjohny@iastate.edu | mjohny.github.io | mjohny | mjohny

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/side projects)
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**, Prudsys Data Mining Cup (International Competition) — *Berlin, Germany*
2018 **Second Place**, Statistical Significance Poster Award — *Vancouver, BC*

Domestic

2018 **Teaching Excellence Award**, Iowa State University — *Ames, IA*
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*
2009 **Second Place (Tech Challenge)/Boeing Team Grant**, FIRST Robotics Competition — *St. Louis, MO*

Research

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

- Developed an algorithm to test for interaction between treatments for groups of time series data, and developed novel visualizations of functional anova tests.

Functional Anova Approach to Detect Changes in Soil Moisture and Temperature — *Ames, IA*
Master's Creative Component, Iowa State University — *2016-17*
Advisor: 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 developing 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" Conference on Predictive Inference and Its Applications, Ames, Iowa; May. 2018.
- 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.
- 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.

Oral Presentations

- Iowa State University Tea m 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.
- 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.
- Manju M. Johny, Hongping Ye, "Disaccharide Analysis to Test Ruminant Contamination of Heparin" FDA Summer Research Symposium, St. Louis, MO USA; Aug 2013.
- 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.

Teaching

Instructor

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

2017 **STAT 105 XW: Intro to Statistics for Engineers (online class)**, 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 **Mathematics Tutor**, Jefferson College *Hillsboro, MO*

Activities & Community Outreach

2014-18 **Member**, American Statistical Society *Ames, IA*
2014-17 **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*
  - Randomization-based inference, ANOVA, linear models, estimation & inference, etc.
- STAT 510: Statistical Methods II (Using R) . . . . . *Spring 2015*
  - Linear mixed models, generalized linear & linear mixed models, estimation & inference, etc
- STAT 520: Statistical Methods III (Using R) . . . . . *Fall 2015*
  - Nonlinear regression, GLM, Monte Carlo studies, bootstrap, cross validation, hierarchical models, etc
- STAT 601: Advanced Statistical Methods (Using R) . . . . . *Spring 2017*
  - Latents variables, stochastic process, simulation based model assessment, etc
- STAT 611: Theory & Application of Linear Models . . . . . *Fall 2016*
  - Theory of least squares, best linear unbiased estimation, distribution of quadratic forms, etc.
- STAT 542: Theory of Probability & Statistics I . . . . . *Fall 2014*
  - Probability and conditional probability, moment generating functions, convergence, etc.
- STAT 543: Theory of Probability & Statistics II . . . . . *Spring 2016*
  - Estimation, maximum likelihood, hypothesis testing, etc.
- STAT 641: Foundation of Probability Theory . . . . . *Fall 2016*
  - Measures, probability measures, integration and expectation, L_p spaces, etc.
- STAT 642: Advanced Probability Theory . . . . . *Spring 2017*
  - Convergence for random variables, laws of large numbers, central limit theorems, etc.
- STAT 551: Time Series Analysis (Using R, ITSM) . . . . . *Fall 2015*
  - Stationarity, temporal dependence, MA & AR structures, prediction & forecasting, etc.
- STAT 534: Ecological Statistics (Using R, JAGS) . . . . . *Fall 2015*
  - Estimation of abundance, survival from recapture studies, hierarchical models, etc.
- STAT 544: Bayesian Statistics (Using R, JAGS) . . . . . *Spring 2016*
  - Prior specification, hierarchical models, MCMC, model diagnostics, etc.
- STAT 615: Advanced Bayesian Methods (Using R, JAGS, STAN, Rcpp (integration of R and C++)) . . . . . *Fall 2017*
  - Hierarchical models, State-space models, spatial models, MCMC algorithms, etc.
- STAT 546: Non-parametric Methods in Statistics . . . . . *Fall 2017*
  - smoothing methods, kernal density estimation, smoothing parameter selection, etc.
- STAT 579: An Introduction to R (Using R, SQL) . . . . . *Fall 2014*
  - statistical programming in R, graphics, looping, function construction,etc
- STAT 580: Statistical Computing (Using R, C) . . . . . *Spring 2015*
  - Introduction to C, interface of R and C, implementation of simulation techniques, etc.

If you are interested in learning more about me or viewing some of my research projects, please visit my website: https://mjohny.github.io