Manju M. Johny

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Education

Doctor of Philosophy in Statistics *Ames, IA*
IOWA STATE UNIVERSITY *Dec 2021 (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, Rstudio, JMP, Excel, Git (fluent); Python, Jupyter Notebook, JAGS, SAS (familiar)
Typesetting	LaTeX (fluent)
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

2018	**First Place (Cleveland) and Global Nominee**, NASA's International Space Apps Challenge (International Hackathon)	*Cleveland, OH*
2018	**Second Place**, Statistical Significance Poster Award, Joint Statistical Meetings	*Vancouver, BC*
2016	**Second Place**, Prudsys Data Mining Cup (International Competition)	*Berlin, Germany*

DOMESTIC

2018	**Teaching Excellence Award**, Iowa State University (Graduate Teaching Award)	*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*
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*

Research

Machine Learning Intern *Cleveland, OH*
SCIENTIFIC COMPUTING AND VISUALIZATION TEAM, NASA GLENN RESEARCH CENTER *Fall 2018/Summer 2019*
MENTORS: VIKRAM SHYAM, PH.D; HERBERT SCHILLING, PH.D

- Developed image and pattern classification capabilities for Periodic Table of Life (a biomimetic design tool for nature-inspired systems) using deep learning. In particular, neural networks were utilized to identify and locate organisms, and the underlying patterns in image data.

Functional Anova Approach to Detect Changes in Soil Moisture and Temperature *Ames, IA*
MASTER'S CREATIVE COMPONENT, IOWA STATE UNIVERSITY *2016-17*
ADVISOR: PETRUȚA 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 groups of time series curves using non-parametric methods, 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 Ion Mobility Spectrometry instruments.
- Research culminated in 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

- Developed Raman and near Infrared spectral libraries for screening of pharmaceutical materials. Performed disaccharide analysis to test for ruminant contamination in heparin.
- 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)
- Grace J Vaziri, Manju M Johny, Petruţa C Caragea, James S Adelman, Social context affects thermoregulation but not activity level during avian immune response, Behavioral Ecology, https://doi.org/10.1093/beheco/ary177
- Shyam, V; Friend, L; Whiteaker, B; Bense, N; Dowdall, J; Boktor, B; Johny, M. M.; Reyes, I; Naser, I; Sakhamuri, N; Kravets, V; Calvin, A; Gabus, K; Goodman, D; Schilling, H; Robinson, C; Reid, R.O.; Unsworth, C. PeTaL (Periodic Table of Life) and Physiomimetics, https://doi.org/10.3390/designs3030043
- 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.
- 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.
- 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

- Manju M. Johny, "Periodic Table of Life (PeTaL): Image Classification" NASA GRC Midterm Presentations, Cleveland, OH USA; Oct 2018.
- 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.
- 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

2019	**STAT 330: Probability and Statistics for Computer Science**, Iowa State University	*Ames, IA*
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

2018	**Mentor**, NASA Club, John Marshall School of Information Technology	*Cleveland, OH*
2014-18	**Member**, American Statistical Society	*Ames, IA*
2014-17	**Member**, STAT-ers Club, Iowa State University	*Ames, IA*
2012/13	**Member (Demonstration Captain)**, Chemistry Club, Saint Louis University	*St. Louis, MO*
2013	**Volunteer (Vision Screening)**, Lion's Club International, Saint Louis University	*St. Louis, MO*
2008-13	**Volunteer**, Sunrise Senior Living	*Des Peres, MO*

Graduate Courses

- Statistical Methods I,II & III (STAT 500, STAT 510, STAT 520)
    - Randomization-based inference, ANOVA, linear models, generalized linear & mixed models, estimation & inference, Monte Carlo studies, bootstrap, cross validation, etc
- Advanced Statistical Methods (STAT 601)
    - Latents variables, stochastic process, simulation based model assessment, etc
- Theory & Application of Linear Models (STAT 611)
    - Theory of least squares, best linear unbiased estimation, distribution of quadratic forms, etc.
- Theory of Probability & Statistics I & II (STAT 542, STAT 543)
    - Probability and conditional probability, moment generating functions, convergence, estimation, maximum likelihood, hypothesis testing, etc.
- Foundation & Advanced Probability Theory (STAT 641, STAT 642)
    - Measures, probability measures, integration and expectation, L_p spaces, convergence for random variables, laws of large numbers, central limit theorems, etc.
- Bayesian Statistics & Advanced Bayesian Methods (STAT 544, STAT 615)
    - Prior specification, hierarchical models, MCMC algorithms, hierarchical models, state-space models, etc.
- Non-parametric Methods in Statistics (STAT 546)
    - Smoothing methods, kernal density estimation, smoothing parameter selection, etc.
- Time Series Analysis (STAT 551)
    - Stationarity, temporal dependence, MA & AR structures, prediction & forecasting, etc.
- Ecological Statistics (STAT 534)
    - Estimation of abundance, survival from recapture studies, hierarchical models, etc.
- Introduction to R, Statistical Computing (STAT 579, STAT 580)
    - Programming in R, graphics, looping, function construction, introduction to C, interface of R & C

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