# CURRICULUM VITAE

Daniel F. Linder
tel# 706-551-0807
daniel.f.linder@gmail.com

I am an assistant professor of biostatistics in the Division of Biostatistics and Data Science at the Medical College of Georgia, Augusta University. My research interests include developing novel methodology and models of biochemical reaction networks, as they pertain to biological gene regulation and disease epidemics, particularly on development of their stochastic formulation, and statistical techniques to fit such models to experimental data, i.e. data arising from RNA sequencing experiments. I also develop statistical and machine learning methodology for big data applications, with emphasis on Bayesian methods for high-dimensional variable selection, dimension reduction, and model selection. Additionally, I am conducting research on sampling methodology that leads to reduced sample size and cost in clinical and epidemiological studies, while maintaining desired study power. I have taught probability, statistics, and programming at the masters and doctoral level since 2012, specifically: Statistical and Machine learning for big data, Bayesian statistics, stochastic processes for systems biology, SAS and SAS MACRO programming and R programming to name a few.

## EDUCATION

**PhD in Biostatistics 2013** Medical College of Georgia at Augusta University.
Advisor: Grzegorz Rempala
Dissertation title: Penalized Least Squares and the Algebraic Statistical Model for Biochemical Reaction Networks

**Masters in Applied Mathematics 2008** Georgia Southern University.
Thesis Advisor: Yan Wu.
Thesis title: Optimal and Permissible Sampling Rates for First-order Sampling of Two-band Signals

**Bachelors of Science in Mathematics 2006** Georgia Southern University. Cum Laude

## PROFESSIONAL

**May 2016 - present** Assistant Professor of Biostatistics at Medical College of Georgia, Augusta University, tenure track.

**August 2013 - May 2016** Assistant Professor of Biostatistics at Georgia Southern University, tenure track.

**August 2012 - August 2013** Visiting Professor of Biostatistics at Georgia Southern University.

**August 2009 - July 2013** Graduate research assistant at Georgia Regents University. Funded through NIH grant, Statistical Methods for Anitgen Receptors Data, R01 CA152158 and the Cancer Center. 20 hour position

**May 2008 - July 2009** Mathematics instructor at Swainsboro Technical College. Full time position

**January 2007 - May 2008** Graduate assistant at Georgia Southern University. Funded through the Department of Mathematics. 20 hour position

**August 2006 - December 2007** Mathematics instructor at Ogeechee Technical College. 20 hour position

# TEACHING EXPERIENCE

Statistical Learning for Big Data (graduate)
Bayesian Statistics I (graduate)
Bayesian Statistics II (graduate)
Stochastic Processes for Systems Biology (graduate)
Readings and Research (graduate)
Biomedical Statistics (graduate)
Introduction to Biostatistics (graduate)
SAS Data Management (graduate)

# GRADUATE STUDENTS TRAINED

### DOCTORAL

Viral V. Panchal, Bayesian multivariate regression for high-dimensional longitudinal data with heavy tailed errors, Dr.P.H. in Biostatistics 2016. Assistant Professor UNC Wilmington

### MASTERS

Kathryn McDonald, Quality of life after twenty-three months of cannabidiol treatment for children with treatment resistant epilepsy, MS in Biostatistics 2019. Doctoral student at Augusta University.

Wayne Lawrence (co advised by Isaac Chun-Hai Fung PhD), Racial disparities in prostate cancer screening behavior and electing of care, MPH in Epidemiology 2015. Doctoral student at State University of New York at Albany.

Jessica Sexton (co advised by Isaac Chun-Hai Fung PhD and Evans Afriyie-Gyawu PhD), Retrospective analysis of sepsis among young infants aged 0-59 days in Ghana through paper-based medical records, MPH in Epidemiology 2015. ASPPH/CDC Allan Rosenfield Global Health Fellow.

### THESIS, DISSERTATION & CAPSTONE COMMITTEES

### DOCTORAL

Jordan Lundeen PhD(c), Dissertation Co-chair (current)
James Dow PhD(c), Dissertation Chair (current)
Oluseyi Odubote PhD(c), Dissertation Chair (current)
Melissa Howie PhD(c), Dissertation Committee Member (current)
Taejin Lee PhD, Dissertation Committee Member (2017)
Jeannie Daniel PhD, Dissertation Commitee Member (2017)
Lewis Perry Dr.PH, Dissertation Committee Member (2015)
Haresh Rochani Dr.PH, Dissertation Committe Member (2014)
Yisong Huang Dr.PH, Dissertation Committee Member and GA supervisor(summer 2014), (2016)
Jingxian Cai Dr.PH, Dissertation Committe Member, (2016)

### MASTERS

Maurice King MD, MS, Thesis Committee Member (2017)

Lutfiyya Muhammad, GA Supervisor, MPH (2014)
Reine Zerbo, GA supervisor, MPH (2014)
Jane Obi, Capstone Advisory Committee, MPH (2014)
Shusen Pu, Thesis Committee Member, Masters in Mathematics (2015)
Anna Khamitova, Thesis Commitee Member, Masters in Mathematics (2014)

# GRANTS AND CONTRACTS

**In Progress**

United States Department of Defense "Machine Learning", PI: Jie Chen, role: Co-I

United States Department of Defense "Theoretical Foundations of Machine Learning", PI: Jie Chen, role: Co-I

The State of Georgia and GW Pharmaceuticals "The Georgia Cannabidiol Study", PI: Yong Park, role: Collaborator

NIH DUA "Medical complications in ESRD patients", PI: N. Stanley Nahman, role: Co-I

NIH R01 "Cytokines in the Regenerating Taste System", PI: Lynnette McCluskey, role: Collaborator

**Completed**

Early Career Award, Mathematical Biosciences Institute, Ohio State University.

Rural Health Research Institute SPRING Grant "Structural Equation Modeling for Obesity and Diabetes Moderation", role: Co-PI 2014

Rural Health Research Institute SPRING Grant "Examining the Rural Influence of Nonmedical Prescription Drug Use in a University Population", role: Co-PI 2014

NIH R01 "Statistical Methods for Antigen Receptors Data", PI: Grzegorz Rempala, role: Researcher 2012-2013

# PRESENTATIONS AND ABSTRACTS

1. Kyle Dymanus, Jack Yu, William Carroll, Maria Helena Lima, **Daniel F. Linder** *The association of influenza on the incidence of orofacial clefts.*, The American Cleft Palate-Craniofacial Association, April 2019

2. Viral Panchal, **Daniel F. Linder**, *Inferring gene networks with global-local shrinkage rules*, ENAR, March 2019 $1^{st}$ place poster presentation.

3. **Daniel F. Linder**, *Modeling stochastic reaction networks*, Division of Biostatistics and Data Science Colloquium, Augusta University, January 2019.

4. **Daniel F. Linder**, *Inference in a class of biochemical reaction networks*, Department of Chemical and Biochemical Engineering, Clemson University, Clemson SC September 2018.

5. **Daniel F. Linder**, *Analysis of the Plague at Eyam...and more*, Multiscale Dynamics of Infections, Mathematical Biosciences Institute, Columbus OH April 2018.

6. **Daniel F. Linder**, *Parameter Inference in Stochastic Reaction Networks*, Multiscale Dynamics of Infections, Mathematical Biosciences Institute, Columbus OH April 2018.

7. **Daniel F. Linder**, *Kinetic rates estimation for reaction networks*, American Mathematical Society, Special Section on Parameter Analysis and Estimation in Applied Dynamical Systems, Columbus OH March 2018.

8. **Daniel F. Linder**, *Algebraic model for reaction network inference*, American Mathematical Society, Special Section on Analytical and Computational Advances in Mathematical Biology Across Scales, Columbus OH March 2018.

9. **Daniel F. Linder**, Grzegorz Rempala, *Parameter inference in reaction networks*, The Ohio State University, March 2018.

10. **Daniel F. Linder**, Grzegorz Rempala, *Bayesian inference in stochastic reaction networks*, Joint Statistical Meeting, Baltimore MD July 2017.

11. **Daniel F. Linder**, Grzegorz Rempala, *Approximate Bayesian methods for reaction networks inference*, The Ohio State University, March 2017.

12. **Daniel F. Linder** *Parameter inference in stochastic dynamical systems from biology*, The University of Georgia, February 2017.

13. **Daniel F. Linder**, *Parameter inference in biochemical reaction networks*, Georgia Statistics Day, Georgia Tech, October 2016

14. **Daniel F. Linder**, Grzegorz A. Rempala *Synthetic likelihood methods for biochemical reaction networks*, Mathematical Biosciences Institute, Ohio State University, September 2016

15. **Daniel F. Linder**, Grzegorz Rempala, *Algebraic Statistical Model for Biochemical Network Dynamics Inference*, Disease Dynamics Seminar GSU, October 6 2014 Arpita Chatterjee, Hani Samawi, Lili Yu, **Daniel F. Linder**, Jingxian Cai, and Robert Vogel, *Regression Estimators Using Stratified Ranked Set Sampling* June 16 2014

16. **Daniel F. Linder**, *Stochastics and Algebra in Biochemical Reaction Networks*, GSU, January 2013.

17. **Daniel F. Linder**, *Bootstrapping Least Squares Estimates for Reaction Networks*, seminar at The Ohio State University, March 1 2013.

18. **Daniel F. Linder** et al., *SILIR: Stochastic model for Salmonella fecal shedding in pigs*, Joint 2012 MBI-NIMBioS-CAMBAM Summer Graduate Workshop on Stochastics Applied to Biological Systems, The Ohio State University, Columbus OH., June 18-19 2012.

19. **Daniel F. Linder**, Yan Wu, *Spectral Properties of Idempotent and Nilpotent Matrices and Applications to DAEs*, Mathematical Association of America MathFest 2006, Knoxville TN., August 10 2006.

# PUBLICATIONS

1. **Daniel F. Linder**, Viral Panchal, *High-dimensional Bayesian phenotype classification and model selection using genomic predictors*, doi: https://doi.org/10.1101/778472 (2019)

2. Viral Panchal, **Daniel F. Linder**, *Inferring gene networks with global-local shrinkage rules*, doi: https://doi.org/10.1101/709741 (2019)

3. Alexandria Volkening, **Daniel F. Linder**, Mason A. Porter, Grzegorz A. Rempała, *Forecasting elections using compartmental models of infections.* arxiv.org/abs/1811.01831 (2018)

4. **Daniel F. Linder**, Grzegorz A. Rempała, *Synthetic likelihood method for reaction network inference.* arxiv.org/abs/1810.02457 (2018)

5. Yelena N. Tarasenko, **Daniel F. Linder**, Eric E. Miller, *Physical activity and mortality among 3+ year cancer survivors in the U.S.*, Cancer Causes and Control (2018) doi: 10.1007/s10552-018-1017-0

6. Hani Samawi, Jingxian Cai, **Daniel F. Linder**, Haresh Rochani, Jingjing Yin, *A simpler approach for mediation analysis for dichotomous mediators in logistic regression*, Journal of Statistical Computation and Simulation (2018) doi: 10.1080/00949655.2018.1426762

7. Hani Samawi, Haresh D. Rochani, Jingjing Yin, **Daniel F. Linder**, Robert L. Vogel, *Notes on kernel based mode estimation using more efficient sampling designs*, Computational Statistics (2018) doi: 10.1007/s00180-017-0787-2

8. Haresh Rochani, **Daniel F. Linder**, Hani Samawi, Viral Panchal, *On inference of multivariate means under ranked set sampling*, Communications for Statistical Applications and Methods (2018), 25(1), 1-13

9. **Daniel F. Linder**, Jingjing Yin, Haresh Rochani, Hani Samawi, Sanjay Sethi, *Increased Fisher's information for parameters of association in count regression via extreme ranks*, Communications in Statistics (Theory and Methods) (2017) doi: 10.1080/03610926.2017.1316859

10. Rajah Jabrah, Hani Samawi, Robert Vogel, Haresh Rochani, **Daniel F. Linder**, Jeff Klibert, *Using ranked auxiliary covariate as a more efficient sampling design for ANCOVA models: analysis of psychological intervention to buttress resilience*, Communications for Statistical Applications and Methods (2017), 24(3), 241-254

11. Arpita Chatterjee, Hani Samawi, Lili Yu, **Daniel F. Linder**, Jingxian Cai, Robert Vogel, *On regression estimators for different stratified sampling schemes*, Journal of Statistics & Management Systems (2017) 20(6): 1147-65

12. **Daniel F. Linder**, Viral Panchal, Hani Samawi, Duchwan Ryu, *Balanced Bayesian LASSO for Heavy Tails*, Journal of Statistical Computation and Simulation (2016), 86(6):1115-1132

13. Shusen Pu, Broderick O. Oluyede, Yuqi Qiu, and **Daniel F. Linder**, *A generalized class of exponentiated modified Weibull distribution with applications*, Journal of Data Science (2016), 14(4):585-614

14. Hani Samawi, Amal Helu, Haresh Rochani, and **Daniel F. Linder**, *Estimation of* $P(X > Y)$ *when* $X$ *and* $Y$ *are dependent random variables using different bivariate sampling schemes*, Communications for Statistical Applications and Methods (2016), 23(5): 385-97

15. Jingjing Yin, Hani Samawi, and **Daniel F. Linder**, *Improved non-parametric estimation of the optimal diagnostic cut-off point associated with the Youden index under different sampling schemes*, Biometrical Journal (2016) doi: 10.1002/bimj.201500036

16. Haresh Rochani, Robert Vogel, Hani Samawi, **Daniel F. Linder**, *Estimates for cell counts and common odds ratio in three-way contingency tables by homogeneous log-linear models with missing data*, Advances in Statistical Analysis (2016) doi: 10.1007/s10182-016-0275-y

17. Hani Samawi, Haresh Rochani, **Daniel F. Linder**, Arpita Chatterjee, *More efficient logistic analysis using moving extreme ranked set sampling*, Journal of Applied Statistics (2016) doi: 10.1080/02664763.2016.1182136

18. Walter Jackson, Richard Govan, Yisong Huang, **Daniel F. Linder**, Eric Worlyano-Gato, *Analysis of Hepatic Protein Expression in Fisher-344 Rats Fed 2-Aminoanthracene*, Journal of Pharmacy and Biological Science 11(2) 50-57 (2016)

19. Lili Yu, Hani Samawi, **Daniel F. Linder**, Arpita Chatterjee, Yisong Huang, Robert Vogel, *On Stratified Bivariate Ranked Set Sampling With Optimal Allocation for Naive and Ratio Estimators*, Journal of Applied Statistics (2016) doi: 10.1080/02664763.2016.1177495

20. Yisong Huang, Hani M. Samawi, Robert Vogel, Jingjing Yin, **Daniel F. Linder**, *Evaluating the efficiency of treatment comparison in crossover designs by allocating subjects based on ranked auxiliary variables*, Communications for Statistical Applications and Methods (2016) 23(1):1-11

21. **Daniel F. Linder**, Grzegorz Rempała, *Bootstrapping Least Squares Estimates for Biochemical Reaction Networks*, Journal of Biological Dynamics (2015) 9, 125-146 doi: 10.1080/17513758.2015.1033022

22. **Daniel F. Linder**, Hani Samawi, Lili Yu, Arpita Charterjee, Yisong Huang, Robert Vogel, *On Stratified Bivariate Ranked Set Sampling for Regression Estimators*, Journal of Applied Statistics (2015), 42(12):2571-2583 doi: 10.1080/02664763.2015.1043868

23. Bettye Apenteng, **Daniel F. Linder**, Samuel Opoku, Raymona H. Lawrence, Linda Upchurch, *Trends in the Use of Volunteers in US Hospices: 2000-2010*, Am J Hosp Palliat Medicine (2014) pii:1049909114557351

24. **Daniel F. Linder**, Grzegorz Rempała, *Algebraic Statistical Model for Biochemical Dynamics Inference*, Journal of Coupled Systems and Multiscale Dynamics 1, 468-475 (2013)

25. Yan Wu, **Daniel F. Linder**, *On the Eigenstructures of Functional K-Potent Matrices and Their Integral Forms*, WSEAS Transactions on Mathematics 9, 244-253 (2010)

26. Yan Wu, **Daniel F. Linder**, *Complete Identification of Permissible Sampling Rates for First-Order Sampling of Multi-Band Bandpass Signals*, WSEAS Transactions on Mathematics 8, 383-392 (2009)

# BOOKS AND CHAPTERS

1. Haresh Rochani, **Daniel F. Linder**, *Markov chain Monte-Carlo methods for missing data under ignorability assumptions* (Book chapter), Monte-Carlo Simulation Based Statistical Modeling, Springer (2017), DOI: 10.1007/978-981-10-3307-07

# MANUSCRIPTS IN REVIEW/PREPARATION

1. Long, S., **Linder, D. F.**, Pope, J., Diamond, M., Park, Y. *Twenty-Three Months of Cannabidiol Treatment for Children with Treatment Resistant Epilepsy*, in preparation.

2. Secansanu, V., Cloyes, R., **Linder, D. F.**, Shah, H., Islam, S. *Repeated dose of thrombolytics in nondraining indwelling tunneled pleural catheters with malignant pleural effusion*, submitted.

3. Viral Panchal, **Daniel F. Linder**, Hani Samawi, *Posterior propriety of global-local shrinkage rules in high-dimensional Bayesian variable selection*, in preparation.

4. Jessica K. Sexton, **Daniel F. Linder**, Evans Afriyie-Gyawu, Zachary McGalliard, Isaac Chun-Hai Fung, *Retrospective analysis of sepsis among young infants aged 0-59 days in Ghana through paper-based medical records*, in preparation.

5. Steven Walker, **Daniel F. Linder**, David White, Yong Teng, Zhangying Zheng, Junko Ariga, Grzegorz Rempala, Jeff Mumm, *Dynamic Bayesian Network Analysis Reveals Unique and Conserved Elements of Genetic Circuitry Governing Two Different Cell-specific Regeneration Paradigms in the Retina*, in preparation

6. **Daniel F. Linder**, *Least Squares Estimation of Biochemical Reaction Rate Functions*, in preparation

# REFEREE

American Journal of Epidemiology
The Handbook of Statistics
Emerging Themes in Epidemiology
Communications in Statistics (Theory & Methods)

# SELECTED COURSES TAKEN

**Bachelors:** Chemistry (A), Organic Chemistry (A), Environmental Biology (A), Calculus I (B), Calculus II (A), Calculus III (B), Analysis I (B), Analysis II (A), Number Theory (A), Applied Mathematics (B), Abstract Algebra I (A), Abstract Algebra II (A), Linear Algebra (B), Ordinary Differential Equations (B), Advanced Ordinary Differential Equations (A), Discrete Mathematics (B), Probability (B), Numerical Analysis (A), Mathematical Modeling (A), Operations Research (A), Data Structures (A), JAVA programming I (A), JAVA programming II (A), Statistical Methods (B). GPA: 3.69

**Masters:** Algorithm Design and Analysis (A), Advanced Partial Differential Equations (B), Digital Signal Processing (A), Advanced Linear Algebra (A), Real Analysis(Measure Theory) (A), Complex Anaysis (A), Advanced Numerical Analysis I (A), Advanced Numerical Analysis II (A), Methods of Optimization (A), Statistical Inference for Biostatistics (A), Statistical Computing (B), Sampling and Survey Methods (A), Combinatorics and Graph Theory (A). GPA: 3.80

**PhD:** Statistical Theory I (A), Statistical Theory II (A), Linear Models I (A), Linear Models II (A), Survival Analysis (A), Clustered and Correlated Data (A), Categorical Data (B), Theory of the Linear Model (A), Generalized Linear Models (A), Advanced Statistical Inference (A), Stochastic Processes (A), Systems Biology (A), Advanced Computational Methods (A), Bayesian Inference (A). GPA: 3.80

# COMPUTATION

**OS:** Windows, UNIX and Mac OS.

**Languages:** R (expert), SAS (expert), Java (expert), C (intermediate), CUDA (beginner), OpenCL(beginner).

**Server:** Currently building a GPU-compute server for faculty and students. Past administrator of an Apple X-Serve, a UNIX based file server, web server and computational cluster for the BBCB core in the Cancer Center.

# REFERENCES

Dr. Grzegorz Rempala, Professor of Biostatistics and Deputy Director of Mathematical Bioscience Institute (MBI), Ohio State University
Email: rempala.3@mbi.osu.edu

Dr. Jeffrey Mumm, Associate Professor in Department of Opthalmology, Wilmer Eye Institute & McKusick-Nathans Institute of Genetic Medicine, Johns Hopkins University,
Email:jmumm3@jhmi.edu

Dr. Hani Samawi, Professor in Department of Biostatistics, Georgia Southern University
Email:hsamawi@georgiasouthern.edu