##### CURRICULUM VITAE

###### Personal Information

Name: Jacob Benjamin

Citizenship: United States

E-mail: bjacob1@usf.edu

Education

1996 B.S. Hawaii Pacific University, Hawaii, Mathematics

1998 M.S. College of Public Health, Tulane University, Epidemiology

2003 Ph.D. School of Medicine University, of Miami, Epidemiology

Employment History

2004 – 2007 Assistant Professor, NIH fellow University of Illinois, Champaign-Urbana, Illinois, Department of Entomology,

2007- 2011 Assistant Professor School of Medicine, University of Alabama,

2007 - Associate Professor, College of Public Health, University of South Florida

## **Research Interests**

Innovative AI and machine learning approaches for managing and analyzing large-scale, geo-located environmental and health data;, Real-world impact of coordinated Earth observation and data stewardship, tech infrastructure and methodologies for advancing cross-sectoral collaboration and data governance in public health.

Teaching at USF

Instructor, Public Health Geographic Systems (PHC 6i940

Instructor, Introduction to Public Health GIS (PHC 5933)

Instructor, Python for Health Analytics (PHC 4933)

Mentoring at USF

PhD students: Nathanael Stanley: Spatial Data Scientist at Moffitt Cancer, Caitlin M. Wolfe Faculty Instructor III, University of South Florida, Sean Beeman: Director of the division of occupational and environmental health and an assistant professor in the Department of Preventive Medicine and Biostatistics in the School of Medicine at the Uniformed Services University of Health Sciences, Ryan Tocartz Assistant Professor of Global Health. Mercer University Chad Wendell U.S. Air Force Tech. Sgt. Ali Mirada Associate Dean of Academic and Student Affairs Duluth, Georgia, Toni Panoua Civil Engineer for Environmental Services Water Resources & Hydrogeology Federal Services, Tampa, Florida, Kyle Watterson: Corporate Director of Rehabilitation, Therapy Services at Shriners Children's Sharad Malavade Infectious Disease Specialist Case Western.,

Dissertation committees for doctoral students: Jeegan Parikh, Santiago Bojorge, Jesse Casanova, Namit Choudhari

Master students: Caleb Jarmilio, Anusha Parajuli, Sasha Mosich, Jing Liu, Zachery Sanders, Heather McDonald, Leomar White, Kayleigh Murray Kori Conklin: Disha Jain, Siqi Li Tatiana Gardellini; Chritopher Villatte Jordan Moberg Jeegan Parikh Suzanne Li, Yessica C. Martinez Ashely Curry, Emily Dinh Miriam Escobar Karan Talreja Samuel S. Alao, James Kukat Zachariah N. Brown, Joshua Wright Grant Johnson, Ryan Ortega Trinadh Dontamsetti Samia Mckeever Emily Swartz

**Funded Grants**

Principal Investigator, “Targeted Mosquito Control through Spectral Fingerprints.” Agency: Uniter Methodist of Tampa, $ 30,000; 07/27/2019 - 1/29/2025

Principal Investigator, “Targeted Mosquito Control through Spectral Fingerprints.” Agency: Joy Mccan Foundation of Tampa, $ 30,000; 07/27/2019 - 1/29/2025

Investigator “Integrated Vector Management: Operational Integration for Onchocerciasis Eradication.” Agency: Bill & Melinda Gates Foundation Grant # OPP114367 (832144702, $200,000 (.50FTE), 9/11/2023- 2/9/2024

Principal Investigator, “Targeted Mosquito Control through Spectral Fingerprints.” Agency: One City Light Ministry, $ 30,000; 07/27/2023 - 1/29/2024

Co-Principal Investigator, “Evaluation of Community-Directed Vector Control on Transmission of Onchocerca Volvulus in a Loa Loa co-endemic Region.” Agency: The Task Force for Global Health (6408112900), $140,669.9205/01/20 – 07/31/22

Co-Principal Investigator, “Dispersion Modeling of Respiratory Aerosols and COVID-19 Infection Risk Analysis in Airport Terminals.” Agency: USF Research Office Internal Award, $25,000; 5/28/20 to 5/27/21

Principal Investigator, “Unmanned Aerial Real Time Mapping of Unknown Mosquito Breeding Site Capture Point Habitats for Implementing Control Techniques.” Agency: USF COPH Internal Award, $100,000; 01/01/20 – 5/31/20

Investigator, “Development of Habitat Signatures for Anopheles Mosquitoes in Cambodia.” Agency: Bill & Melinda Gates Foundation Grant # OPP1171887 (6408-1102-00), $874,456, 6/1/17- 9/30/19

Co-Principal Investigator “Community-directed vector control to enhance mass drug administrative for onchocerciasis elimination in Africa.” Agency: NIAID 1R01AL123245 (6408109700), $2,112,085; 12/29/2016

Investigator “Integrated Vector Management (IVM) County Level Surveillance System.” Agency: Hillsborough County, Public Works, Tampa, FL (6408109900), $99,831 1/27/2017 - 11/2/2017,

Investigator “Integrated Vector Management: Operational Integration for Malaria Eradication.” Agency: Bill & Melinda Gates Foundation Grant # OPP1132624 (6408108700), $400,000 9/11/2015 - 2/9/2017

Investigator “Development of an improved black fly trap for onchocerciasis monitoring and control, Development of a Simulism black fly trap.” Agency: Bill & Melinda Gates Foundation Grant # OPP1017870 (6408104105), $2,142,862 (.20FTE), 7/1/2016 - 12/29/2016

Investigator, “High Resolution Ecological Map.”, Agency: Liverpool (6408107400), $25,000 1/3/2014 - 12/18/2014

Investigator “Transmission of Onchocerciasis.” Agency: The Carter Center (6408103601), $139,876 4/13/2012 – 9/13/12

Investigator, “Development of National Risk Map and Integrated Vector Control Management Policy/Strategy for Uganda.” Agency: ABT Associates, Inc. (USAID) (6408105500), $150,000 3/30/2012 - 7/19/2012

Investigator “Special Modeling of Onchocerciasis foci in Africa by Remote Sensing.” Agency: NIH R01TW008508 (6408103100 & 6408105200), $1,572,200 8/1/2011 - 12/8/2011 12/1/2011 - 3/29/2012 (PI: Unnasch)

Publications Book

**Jacob Benjamin** Edwin Micheals Tech Enables Global Health Security, 978-3-031-86996-9, 632181\_1\_En [Sp2ringer publications]

Chapter 2: Training an artificial intelligent iOS app using a GPU cluster with four nodes of GeForc**e** GTX TITAN X, with 12 GB of memory for optimizing a Regional Convolutional Neural Network VGG-16 model with a Robotic Arm for real-time implementation of Seek and Destroy Malaria Mosquito Larval Source Management tactics in Nkolondon Cameroon

**Benjamin G. Jacob,** Hugues Nana Djeunga, Philippe Nwane, Jesse Casanova, Andre Domche, Arnauld Efon-Ekangouo, Donald Fezeu-Fankam, Namit Choudhari, Antonio-Nkondjio Christophe, Martin Rono, Joseph Mwangangi, Edwin Micheal, Joseph Kamgno

Chapter 4: Zero-Inflated Bayesian Regression Model and a Land Cover Topological Supervised-Classification for Prioritizing Asthma Related Covariables at the State Level.

-Dewan S. Tahsin, Namit Choudhari,

**Benjamin G. Jacob**

Chapter 5: A real-time high-performance artificial intelligent machine learned interactive mobile iOS app for optimizing primary prevention, timeliness diagnosis and rehabilitation cardiovascular emergencies: A vision for smart and connected health care.

**Benjamin Jacob**

Chapter 6: Intentionally violating the univariate assumption of homogeneity of variance covariance matrices employing non-infinitesimal default axiomatic Kolmogorovian probabilities: The sub-multiplicativity of the Frobenius norm quasi-Newtonian algorithms and semi-parametric Markovian non-Gaussian eigen-Bayesianism for resolving tail-weight non-trival deviant trajectories in space time and geography for heuristically robustifying forecasting hyperendemic, georeferenceable, TB estimator determinants in Florida, USA.

-**Benjamin G. Jacob** Ismael Hoare Namit Choudari, Jing Lu, Kayleigh Murray, Heather Mcdonald Sasha Mosich, Alexendar Grimball Anthony Masys

Chapter 7: Interpolating an Eigen-Decomposed Aedes aegypti Swimming Pool Habitat for Implementing “Seek and Destroy” Larval Source Management in Los Angeles County, California Sasha Marie Mosich, Ricardo Izurieta, Ismael Hoare, Namit Choudhari, Heather McDonald, Anthony Masys, **Benjamin Jacob**

Chapter 8: Diagnosing space and time overdispersion due to heteroskedasticity

Nathanael B. Stanley1, Namit Choudhari2, **Benjamin G. Jacob3**

**Peer Reviewed Journals**

1. Jaramillo C, Gambrell A, McDonald H, Choudhari N, Mosich S, **Jacob B** (2025). Poisson Probability Count Variable Model and An Eigen-Bayesian Semi-Parametric Eigen-Autocorrelation for Optimizing Mapping Fentanyl Mortality in Hillsborough County, Florida. J Epidemiol Public Health. 10(02): 217-

2.**Jacob, B**., McDonald, H., Bohn, J. (2024). Closing the Gap on Addiction Recovery Engagement with an AI-infused Convolutional Neural Network Technology Application—A Design Vision. *American Journal of Neural Networks and Applications*, *10*(1), 1-14..

3.McDonald, H. L., Choudhari, N., Murray, K., White, L., Yost, B., Bohn, J., **Jacob, B.**.. (2024). Sentinel-2 visible and near-infrared reflectance signature data for mapping potential geolocations of curb cuts in Hillsborough County, Florida. *Journal of Geography and Regional Planning*

4.Gambrell1 Alexander M. \*, Namit Choudhari1, Saurav Chakraborty1, Jing Liu2, Heather McDonald2, Sasha Mosich2, **B. Jacob** (2024) Employing Second Order Geospatial Autocorrelation Statistics and an Eigen-Bayesian Semi-Parametric Markovian Non-Gaussian Model for Interpolating Culex quinquefasciatus Storm Sewer Habitats in Bexar and Dallas Counties Texas, U.S.A Annals of Biostatistics & Biometric ISSN: 2641-6336.

5.Hernandez-Bojorge S, Gardellini T, Parikh J, Rupani N, **Jacob B**, Hoare I, Calvopiña M, Izurieta R. Ecuador Towards Zero Leprosy: A Twenty-Three-Year Retrospective Epidemiologic and Spatiotemporal Analysis of Leprosy in Ecuador 2024. Trop Med Infect Dis. 19;9(10): 246.

6 **Jacob B**, Michael E, Unnasch TR. Community-Directed Vector Control to Accelerate Onchocerciasis Elimination. 2024 Pathogens... 21;13(3):268.

7.Ritchi1 Kristen Keana, Ricardo lzurieta, Ismael Hoare Namit Choudhari, Kayleigh Murray, Brooke Yost, David Fiess, Paolo Pecora, Anthony Masys, **B. Jacob** 2024 Signature Mapping Ae. aegypti Bird Bath Habitats Using a Bayesian Maximum Likelihood Classifier for Implementing "Seek and Destroy" Larval Source Management in Hillsborough County, FL. USA American Journal of Entomolog..;11(5):26-38.

8.Liu, J. Choudhari, Namit Brooke, Yost **B. Jacob**. (2023) Employing an Eigenfunction

Eigendecomposition algorithm to cartographically and statistically delineate traffic-related carbon monoxide pollution in Hillsborough County, Florida 10.5897 Journal of Public Health and Epidemiology10(7):15-28.

9.Isabelle Burnett, A., Izurieta, R., Hoare, I., Choudhari, N., Casanova, **B Jacob.** (2023). Mapping Potential Anopheles stephensi Habitats for Implementing “Seek and Destroy” Malaria Larval Source Management in Kwale County, Kenya. American Journal of Entomology, 7(4), 120-129.

10.Gross, M., Schwartz, S., & **Jacob, B**. (2022). An analysis of average temperature and elevation on tuberculosis incidence within the Appalachian region. Journal of Public Health and Epidemiology, 14(2), 60-71.

11. **Jacob Benjamin G**. (2022) Decomposition matrices and Fast Fourier transforms derivable from the solution of linear algebraic formulations ascending amongst finite elements of Galerkin well-posedness methods employing piecewise Hermite bicubics for optimal quantization of Poisson’s equation based on the orthogonality of the unit square spline collocation counterparts and an O(N 2logN) operation on an N×N uniform partition American Journal of Mathematics **3 (5), 12—25...**

**12.Jacob, B.., Denis Loum, Martha Kaddumukasa, Joseph Kamgno, Hugues Nana Djeunga, André Domche, Philip Nwane, Joseph Mwangangi, Santiago Hernandez Bojorge, Jeegan Parikh, Jesse Casanova, Ricardo Izureta, Edwin Micheal, Thomas Mason, Alfred Mubangizi, 2021, Geospatial Artificial Intelligence Infused into a Smartphone Drone Application for Implementing 'Seek and Destroy' in Uganda, American Journal of Entomology. 5, (4), 92-109**

13**.Jacob B,** Loum D, Lakwo T, Byamukama E, Habomugisha P, Cupp E Unnasch TR 2021Optimization of Slash and Clear Community-Directed Control of Simulium damnosum Sensu Stricto in Northern Uganda. Am J Trop Med Hyg.;104(4):1394-1403.

14**.Jacob B.,** Loum D, Munu D, Lakwo T, Byamukama E, Habomugisha P, Cupp EW, Unnasch TR. Optimization of Slash and Clear Community-Directed Control of *Simulium damnosum* Sensu Stricto in Northern Uganda. (2021) Am J Trop Med Hyg. 00(0,) pp. 1–10

15.Hernandez, S. E., Parikh**, J.,** Blass-Alfaro, G., Rickloff, M. A., & **B.** **Jacob.** (2020). Meteorological factors associated with a high prevalence of leishmaniasis in Nicaragua. *Journal of Public Health and Epidemiology*, *12*(4), 329–339

16.Cozart D, Lakwo T, Liu C, Loum D. **Jacob B,** Cupp E, Unnasch T. 2020 Identification of Human-Derived Attractants to *Simulium damnosum* Sensu Stricto in the Madi-Mid North Onchocerciasis Focus of Uganda *Am J Trop Med Hyg*. 10.(42) 1-6

17.Minakshi, M., Bhuiyan, T., Kariev, S., Kaddumukasa, M., Loum, D., Stanley N. B., Chellappan, S., Habomugisha, P., Oguttu, D. W., & **Jacob, B** (2020). High-accuracy detection of malaria mosquito habitats using drone-based multispectral imagery and Artificial Intelligence (AI) algorithms in an agro-village peri-urban pastureland intervention site (Akonyibedo) in Unyama Sub–County, Gulu District, Northern Uganda. Journal of Public Health and Epidemiology, 12(3), 202-217.

18.**Jacob B.,** and Novak Robert J. **Efficaciously targeting unknown Anopheles daris orthomosiacked eco- georeferenceable capture points employing photogrammetric Rayleigh optical depths as a function of sub-meter resolution semi-infinite anisotropical azimuthally krigable asymmetrical scattering signature spectroscopic frequencies under disproportionate solar exoatmospheric irradiance conditions in eigenspace in a semi-autonomous unmanned aircraft ArcGIS real-time dashboard Principal Component Analysis** Annals of Biostatistics & Biometric 2020 11(6), 9-17.

19**.Jacob B**. Loum D, Lakwo TL, Katholi CR, Habomugisha P, Byamukama Unnasch T (2019) Community-directed vector control to supplement mass drug distribution for onchocerciasis elimination in the Madi mid-North focus of Northern Uganda. PLoS Neglected Tropical Dis ease12(8): 1-21.

20**Jacob B.** (2019) Decomposition matrices and Fast Fourier transforms derivable from the solution of linear algebraic formulations ascending amongst finite elements of Galerkin well-posedness methods employing piecewise Hermite bicubics for optimal quantization of Poisson’s equation based on the orthogonality of the unit square spline collocation counterparts and an O(N 2logN) operation on an N×N uniform partition American Journal of Mathematics 17(8): 12-31.

21**.Jacob B,** Loum D, Lakwo TL, Katholi CR, Habomugisha P, Byamukama Unnasch T (2019) Community-directed vector control to supplement mass drug distribution for onchocerciasis elimination in the Madi mid-North focus of Northern Uganda. PLoS Negl Trop Dis 12(8): 1-15.

22.Domche, A., Nana Djeunga, H.C., Nwane, p. **B. Jacob** **Joseph Kamgno,** (2019). Significant reduction of blackfly densities in persistent onchocerciasis area following pilot implementation of an environment friendly approach (Slash and Clear). Sci Rep 14, 40-52

.23.Moberg J., Toni Panaou, **B Jacob** (2018). A least square fitting technique, a nontrivial diagonal matrix and a zero-inner product for interpolating disproportionately weighted landscape regression estimates for identifying vulnerable populations to chlamydia in Miami-Dade County, Florida. International Journal of Geographic Information Systems 5(5): 21-29.

24.Curry A, Toni Panaou, Samuel Alao, **Benjamin Jacob**. (2018). Introducing an extra binomial variation scheme in a linear-logistic model for fitting Poissonian noise in a sub-county-level, forecast vulnerability grid-stratified zip code polygon to optimally regressively quantitate measles endemicity in Florida. International Journal of Geographic Information System, 5(5): 1-8.

25.Li, S., Toni Panaou, Kyle Watterson, **Benjamin Jacob**. (2018). Validating Causal Relationships of Chronic Hepatitis B Infections stratified by frequentism and urbanicity for Identifying Potential Endemic County Regions in Florida. International Journal of Geographic Information System, 4(4)17-28.

26**.Jacob Benjamin** and Robert J. Novak (2017) Gauging queryable iterative estimator uncorrelatedness from incompatibilistic propagational Poissionian noise in eigen-normalized non-negativity constraints employing analogs of the Pythagorean theorem and parallelogram laws in sub-meter resolution pseudo-Euclidean space in C++ for semi-parametrically prognosticating synergistic semi-logarithmic Aedes aegypti non-ordinate axis-scaled landscape weightage covariances of episodical sylvatic yellow fever case distributions for an agro-irrigated riceland village ecosystem in Gulu, Uganda. Journal of Advanced Mathematics: 7(3):1-448.

27.Dinh E and **B. Jacob (**2017) A Negative Binomial with a Non- Homogenous Gamma Distributed Mean for Robustifying Pseudo R2 Regression Values of Immature Vector and Nuisance Mosquito Count Data for Optimally Discerning Un-Geosampled Waste Tire Oviposition Sites in a Subtropical Habitat in SAS®/GIS Using Worldview-3 Visble and Near Infra-Red Data in Hillsborough County, Florida. Journal of Remote Sensing & GIS 6(7):22-27.

28.Escobar, Miriam F. Toni Panaou, Samuel Alao, **Benjamin Jacob.** (2017). Robustification of Multivariate Non-zero correlated Gamma Mixture Distributed Multicollinear, Discrete Finite Count-related Heteroskedastic, Integer Values for Regressively Delineating Morbidity Statistics in Guatemala. International Journal of Geographic Information System, 4(3):7-18.

29.Martinez Y. C, Toni Panaou, Samuel Alao, **Benjamin Jacob.** (2017). Employing ArcGIS Spatial Analyst extensions and linear regression statistics to prioritize vulnerability to cervical cancer in an eco-georeferenced grid-stratified zip code polygon eco-geographically classified in Hillsborough County, Florida. International Journal of Geographic Information System, 4(3):23-30.

30.Conklin K. Toni Panaou, **Benjamin Jacob.** (2017). Accounting for first-order differential flux extinction through dimensionless, radiation-based discontinuous vegetated canopies employing near infra-red and red wavelength proxy spectral irradiance for approximating unobserved isoline convergence and soil-perturbed responses in capture point endmember signatures positively autocorrelated to endemic Naegleria fowleri sample sites. International Journal of Geographic Information System, 6(5):34-42.

32.Talreja K. and **Benjamin. Jacob** (2017). Regressively prioritizing sociodemographic and landscape covariates for iteratively cartographically quantitating vulnerability for oral cancer in a county, grid-stratified, georeferenced zip code polygon, International Journal of Geographic Information System, 6(5);56-64.

33`.Parikh, Jeegan U. Toni Panaou**, Benjamin Jacob.** (2017). Regressively distinguishing the determination of coefficient of heterogeneous socio-demographic and clinical diagnostics human immunodeficiency virus covariates on Tuberculosis prevalence in a georeferenced grid-stratified zip-code, county level polygon, International Journal of Geographic Information System, 4(3):35-42.

34Leandro-Reguillo, P. Toni Panaou, Ryan Carney, **Benjamin Jacob.** (2017). Fuzzification of multi-criteria proxy geoclassifiable vegetation and landscape biosignature estimators to predict the potential invasion of Aedes aegypti in Barcelona, Spain, International Journal of Geographic Information System, 4(2): 12-21.

35.Gardner William L., Toni Panaou, Kyle Watterson, Sam Alao, **Benjamin Jacob.** (2017). Predicting potential human trafficking recruiting geolocations using eigendecomposed non-zero spatial autocorrelation coefficients and Poissonian heterogeneous gamma distributed variables, International Journal of Geographic Information System, 5(4):47-61.

34=6.Panaou, Toni Samuel Alao and **Benjamin Jacob.** (2017). Hypothetically quantifying flood vulnerability in a reservoir tributary employing 3-dimensional geomorphological terrain related covariants, a stochastic iterative quantitative interpolator and a space-time global circulation model paradigm. Journal of Remote Sensing & GIS, 5(4); 23-35.

37.Brito M. Paulo R., Vannedunem P. Martins A. Unnasch T.R., Novak R.J., (2017) **Jacob B**.., Stanton M.C., Molyneux D.H., Kelly-Hope L.A.2017. Integrated clinical survey to determine prevalence and co-distribution patterns of lymphatic filariasis and onchocerciasis in a Loa loa co-endemic area: The Angolan experience Parasitology and Epidemiological Control: 2: (3); 71-84.

38.**Jacob, B..** Shafer S. Alinda P. Loun D, McKinnon A. Munu D. Katabarwa M. N., Lakwo T. Habomugish P., Unnasch T. R (2017)Lexicographically, cartesian-ordered, differential calculi in canonically extractable in-situ near infra-red fluorescence quantum spectroscopic sub-surface continuous geodesic fluxions for metaheuristic chlorophyll-a translucent emissivity mapping intermittently canopied immature narrow riverine tributary Simulism damnosum s.l. oviposition sites for bio-optically delineating multivariate normalized Gaussian processes elucidative administrated by prior covariances and a spline within a reproducing non-frequentist simultaneous diagonalization of amalgamized positive definite kernels in Hilbert space: Implementation of a ‘Slash and Clear’ control intervention in two eco-georeferenceable agro-village complexes in Northern Uganda. Journal of Geophysics and Remote sensing 4(5):26-221.

39.Graydon R.C., Samuel Alao and **Benjamin G Jacob** (2016). Moran’s Autocorrelation and Hot Spot Analysis for Identifying and Predicting Diarrheal Disease Cases around Sixty-Seven Community Wells in West Pokot County, Kenya. J Remote Sensing & GIS, 7(4);17-25.

40.Panchang S., Samuel Alao **Benjamin Jacob** Ricardo Izurieta (2016) Mapping Minimum and Maximum Standard Deviation 3-Dimensionsional Slope Coefficients for Geo-spectrotemporally Iteratively Quantitatively Interpolating an End-member Proxy Signature of Cyanobacteria (Bluegreen Algae) for Eco-cartographically Delineating Cholera Risk in a Riverine Tributary Ecosystem in Ecuador Journal of Remote Sensing & GIS 6(7): 13-19.

41.Alao S., Komi Mati and **Benjamin Jacob** (2016): Differentiating Non-Homoscedasticity and Geospatially Extreme Outliers for Urban and Rural Landscape Dataset Using Pearson's Product Moment Correlation Coefficients for Quantitating Clustering Tendencies in Non-Vaccinated Measles Populations in Nigeria. Journal of Remote Sensing & GIS 6(7): 13-19.

42.. Zachariah N. Brown, Samuel S. Alao, Sarah E. Schaffer, **Benjamin G. Jacob** (2016). Quantitating Three-Dimensional Impervious Surface Fractions Employing Geo-Schematic Layout algorithms, Isarithmic Maps and Non-Contiguous Cartograms for Identifying Hydrodynamic Catchment Flood Vulnerable Basins of High-Priority Hurricane Evacuation Routes and Levee Construction Sites in Hillsborough County, Florida Journal of Remote Sensing & GIS 5(2):16-27.

43.Moradi A. Schaffer S, Izurieta R. Hoare l. Pettersen T.M., **Jacob B** (2016) The persistence of tuberculosis in the United States: Spatial analysis and predictive modeling in the move toward elimination of Tuberculosis Journal of Public Health and Epidemiology. 5(7);14-20.

44**.Jacob B**. and Novak R.J. (2016) Pernicious quasi-normal non-monotonic Poissionian non-negativity constraints for optimally rectifying incompatibilistic endeogeneity in sub-meter resolution pseudo-Euclidean regression space employing analogs of the Pythagorean theorem and parallelogram laws for semi-parameterically demarcating non-trivial land cover wavelength filters and time series impulse-response metrological functions in an invertible Hermitian transjugate matrix while consolidating synergistic semi-logarithmic non- ordinate axis-scaled covariances in C++ for forecasting episodical yellow fever sylvatic, case distributions in an eco-georeferenceable irrigated riceland complex in Gulu, Uganda Journal of Applied Mathematics and Statistics, 3(4): 42-366.

45**.Jacob B.** and Novak R.J. (2015) Integrating a Trimble Recon X 400 MHz Intel PXA255 Xscale CPU® Mobile Field Data Collection System Using Differentially Corrected Global Positioning System Technology and a Real-Time Bidirectional Actionable Platform within an ArcGIS Cyberenvironment for Implementing Malaria Mosquito Control. Advances in Remote Sensing; 3(3):141-196.

46**.Jacob B,** Novak RJ, Toe LD, Sanfo M, Griffith DA, Lakwo Unnasch T (2015). Ecogeographically and Non-Ecogeographically Forecasting Discontinuously Canopied Seasonally Hyperproductive Trailing Vegetation Precambrian rock Simulium damnosum s.l., Eco-epidemiological Capture Point Morphometrics by Geo-spectrotemporally Iteratively Stochastically Interpolating Metrizable Sub-Mixel Mean Solar Exoatmospheric Quantum Scalar Irradiance Wavelength Periodicities where θi is a Zenith Angle and Diatonically Etiolated Xanthophylls with Azimuthally Isotropic Sources of Chloroplastic Carotenoid Zeaxanthins Stoichiometrically Extracted from a Rapid Eye™ Red Edge Normalized Difference Vegetation Index Reference Biosignature: A Case Study in Burkina Faso and Uganda (Journal of Geophysics and Remote sensing 2015 5(1):. 12-103.

47.**Jacob B**. Mendoza D.M, Ponce M., Caliskan S., Moradi M, Gotuzzo E, Griffith D.A., Novak R.J. (2014) Pseudo R2Probablity Measures, Durbin Watson Diagnostic Statistics and Einstein Summations for Deriving Unbiased Frequentist Inferences and Geoparameterizing Non-Zero First-Order Lag Autocorvariate Error in Regressed Multi-Drug-Resistant Tuberculosis Time Series Estimators American Journal of Applied Mathematics and Statistics 2(5):252-30.

48Johnson, G. Brock Graham, **Benjamin G. Jacob** (2015). Optimally Rectifying Non-homogenous Poisson Probability Count Outcome Variation Forecasts in an Endemic County Level Syphilis Model. International Journal of Advanced Mathematics 25(7):14-22.

49.**Jacob B.**., Novak L. Toe, Sanfo, S. Caliskan, Unnasch T. (2014). Denoising a model employing automated bandwidth selection procedures and pre-whitened Euclidean-based quadratic surrogates in PROC ARIMA for optimizing asymptotic expansions and simulations of onchocerciasis endemic transmission zones in Burkina Faso Journal of Public Health and Epidemiology 6(11): 347-389.

50. **Jacob B.,** Griffith D A, Caliskan Semiha, Gunawardena Dissanayake 3, Novak Robert J 2013 Heuristically optimizing logarithmically transformed mean zero Gaussian vectors in PROC ARIMA using a random deviation from an intercept term and a normal frequency distributed Autoregressive Integrated Moving Average Time Series for forecasting malarial regressors in Uganda International Journal of Geographic Information System. 11(1): 1 – 143.

51. **Jacob B.,** Novak L. Toe, Sanfo, S. Caliskan, Unnasch T. 2013. Finite –Difference derivatives of a fist-order integral approximation quantized with a default Quasi-Newton Optimizer and a Pseudo-Lipschitzian property for predictive mapping spatially inhomogenous Similium damnosum s.l. explanatory covariates. Journal of Statistics: Advances in Theory and Applications 10(10):1-250.

52. **Jacob B..,** R.J. Novak, L. Toe, M.S. Sanfo, S. Caliskan, R. Tingueria, A. Pare, M. Noma, L. Yameogo, T.R. Unnasch, (2013), “Definability of combinatorial functions and their linear recurrence relationships within a polylogarithmic triangularizable matrix in ArcGIS employing surjective bilipschitz functions and other isomorphisms of metric spaces for forecasting seasonal endemic onchocerciasis transmission zones in Burkina Faso," Scientific Journal of Pure and Applied Sciences, 2, (12) :42-61.

53**. Jacob Benjamin**., Fiorella Krapp, Mario Ponce, Nanhua Zhang, Semiha Caliskan, Daniel A. Griffith, Eduardo Gotuzzo and Robert J. Novak (2013), A Bayesian Poisson specification with a conditionally autoregressive prior and a residual Moran’s coefficient minimization criterion for quantitating leptokurtic distributions in regression-based multi-resistant tuberculosis treatment protocols, Journal of Public Health and Epidemiology. 5(3) :122-143.

54**.Jacob, B.**, Ranjit de Alwiss, Semiha Caliskan, Daniel A. Griffith, Dissanayake Gunawardena, Robert J.2013 A Random-effects Regression Specification Using a Local Intercept Term and a Global Mean for Forecasting Malarial Prevalence. American Journal of Computational and Applied Mathematics 3(2): 49-67.

55**.Jacob B,** Novak RJ, Toe LD, Sanfo M, Griffith DA, Lakwo TL, et al. (2013) Validation of a Remote Sensing Model to Identify Simulium damnosum s.l. Breeding Sites in Sub-Saharan Africa. PLoS Neglected Tropical Diseases 7(7): 32-42.

56. **Jacob B.** Toe L. Sanfo MS., Afriyie A., Ibrahim MI., Griffith DA, Novak RJ Unnasch Thomas. 2012 Quasi- likelihood techniques in a logistic regression equation and probability density functions from an inverse Wishart-distributed matrix for identifying intra-cluster covariate coefficients of Simulium damnosum s.l. riverine habitats in Togo Geospatial Information Science 15(2):117-133.

55=7**.Jacob B,** Novak RJ, Toe L, Sanfo MS, Caliskan S, et al. (2011) Unbiasing a Stochastic Endmember Interpolator Using ENVI Object-Based Classifiers and Boolean Statistics for Forecasting Canopied Simulium damnosum s.l. Larval Habitats in Burkina Faso. J Geophys Remote Sensing (15) 22-34.

58 **Jacob Benjamin** DD. Chadee (2011) Adjusting second moment bias in eigenspace using Bayesian empirical estimators, Dirichlet tessellations and Worldview 1 data for predicting Culex quinquefasciatus in Trinidad Journal of Geographic Information Systems (14)2: 244-274.

56=9**.Jacob B** Griffith DA, Mwangangi JM Gathings DG, Mbogo CB, Novak RJ (2011) A cartographic analyses using spatial filter logistic model specifications for implementing mosquito control in Kenya Urban Geography Vol 32: 363-377.

60**.Jacob B,** Morris JA, Caamano EX, Griffith DA, Novak RJ. (2011) Geomapping generalized eigenvalue frequency distributions for predicting prolific Aedes albopictus and Culex quinquefasciatus habitats based on spatiotemporal field-sampled count data Acta Tropica. 2:61-68.

51.**Jacob B**. Mwangangi JM Mbogo CB, Novak RJ (2011) A Taxonomy of Unmixing Algorithms Using Li- Strahler Geometric- Optical Model and other Spectral Endmember Extraction Techniques for Decomposing a QuickBird Visible and Near Infra-red Pixel of an Anopheles arabiensis Open Remote Sensing 17(3)-11-24.

52**.Jacob B** Gunter JT, Muturi EJ, Caamano EX, Githure JI, Regens JL, Novak RJ. 2010. Quantifying Stochastic Error Propagation in Bayesian Parametric Estimates of Anopheles gambiae s.l. aquatic habitats. International Journal of Remote Sensing 11:67-78.

63**. Jacob** B., Krapp F, Ponce M, Gotuzzo E, Griffith DA. Novak R J. 2010. Accounting for autocorrelation in multi- drug-resistant tuberculosis predictors using a set of parsimonious orthogonal eigenvectors aggregated in geographic space Geospatial Health 4(2): 201-217.

64 **Jacob B.,** Griffith D.A., Mwangnagi J.M. Mbogo C., Novak RJ. 2010 Uniform Convergence of Ergodic Markov Chains Using Gaussian Quadratures in SAS PROC NLMIXED for Calculating Marginal Likelihoods in Space Time-Varying Coefficients of Urban Anopheles gambiae s.l. aquatic Habitats Acta Parasitology of China 14: (3) 41-53.

65. **Jacob B** Lampman RL, Ward MP, Muturi E, Funes J, Morris JC. 2010. Geospatial variability of Culex pipiens and Culex restuans aquatic habitats in urban Champaign, Illinois. International Journal Remote Sensing 30(8): 5-19.

66**.Jacob B,** Burkett N, Luvall J, Parcak S, McClure CJW, Estep L, Hill GE, Cupp EW, Novak RJ, Unnasch TR. Developing GIS-Based Eastern Equine Encephalitis Vector-host Models in Tuskegee, Alabama. 2010. International Journal of Health Geographics, 9:12-21.

67. **Jacob B**, Gu W, Caamano EX, Novak RJ. Developing operational algorithms using linear and non-linear square estimation in Python for the identification of Culex pipiens and Culex restuans in a mosquito abatement district (Cook County, Illinois, USA) Geospatial Health 2009:3(2):157-176.

68**.Jacob B,** Griffith DA, Muturi EJ, Caamano EX, Githure JI, Novak RJ. A heteroskedastic error covariance matrix estimator using a first-order conditional autoregressive Markov simulation for deriving asymptotic efficient estimates from ecological sampled Anopheles arabiensis aquatic habitat covariates. Malaria Journal 2009; 8(1):216-225.

69 **Jacob B.**, Daniel Griffith, James Gunter, Ephantus J. Muturi, Erick Caamano, Josephat Shililu, John Guthure, James Regens and Robert J. Novak. 2009. Describing Anopheles arabiensis aquatic habitats in two riceland agro-ecosystems in Mwea, Kenya using a negative binomial regression model with a non-homogenous mean Acta tropica 109(1):17-26.

70**.Jacob B,** Griffith DA, Novak RJ, 2008. Decomposing malaria mosquito aquatic habitat data into spatial autocorrelation eigenvectors in a SAS/GIS® module. Transactions in GIS 12: 341-364.

71.Joseph M. M. Mwangangi, Ephantus J. Muturi, Josephat I. Shililu, Simon M. Muriu, **Benjamin Jacob,** Ephantus W. Kabiru, Charles M. Mbogo, John I. Githure and Robert Novak. 2008. Contribution of different aquatic habitats to adult Anopheles arabiensis and Culex quinquefasciatus (Diptera: Culicidae) production in a rice agroecosystem in Mwea, Kenya. Journal of Vector Ecology. 33 (1): 129-138.

72.Muturi Ephantus J., Joseph Mwangangi, Josephat Shililu, **Benjamin G. Jacob**, Charles Mbogo, John Githure, and Robert Novak. 2008. Environmental factors associated with the distribution of Anopheles arabiensis and Culex quinquefasciatus in a rice agro-ecosystem in Mwea, Kenya. Journal of Vector Ecology. 33 (1): 56-63.

70-3.Muturi Ephantus J., **Benjamin G. Jacob**, Chang-Hyun Kim, Charles M. Mbogo and Robert Novak. 2007. Are co-infections of malaria and filariasis of any epidemiological significance? Parasitology Research.102: 175-181.

71-4. Muturi Ephantus J., **Benjamin G. Jacob**, Josephat Shililu and Robert Novak 2007. Laboratory studies on the effect of inorganic fertilizers on survival and development of immature Culex quinquefasciatus (Diptera: Culicidae). Journal of Vector Borne Diseases, 44: 259-265.

75**.Jacob B**, Muturi EJ, Caamano EX, Gunter JT, Mpanga E, Ayine R, Okelloonen J, Pen-Mogi Nyeko J, Shililu JI, Githure JI, Regens JL, Novak RJ, Kakoma I. 2008. Hydrological modeling of geophysical parameters of arboviral and protozoan disease vectors in Internally Displaced People camps in Gulu, Uganda. International Journal of Health Geographics. 7(11): 11-16.

76.Muturi, Ephantus J. Simon Muriu, Josephat Shililu, Joseph Mwangangi, **Benjamin G. Jacob**, Charles Mbogo, John Githure, And Robert Novak. 2008. Effect of rice cultivation on malaria transmission in central Kenya. American Journal of Tropical Medicine and Hygiene. 7(8): 270-275.

77.Muturi EJ, Mwangangi JM, **Jacob B**, Shililu JI, Mbogo C, Githure J and Novak RJ. 2008. Spatio-temporal dynamics of immature culicines (subfamily Culicinae) and their larval habitats in Mwea Rice Scheme, Kenya. Parasitology Research (5:24-33).

78.Muriu SM, Muturi EJ, Shililu JI, Mbogo CM, Mwangangi JM, **Jacob B**, Irungu LW, Mukabana RW, Githure JI and Novak RJ. 2008. Host choice and multiple blood feeding behavior of malaria vectors and other anophelines in Mwea rice scheme, Kenya. Malaria Journal. 7(3): 43-52.

79.Muturi EJ, Shililu JI, **Jacob B,** Mwangangi JM, Mbogo CM, Githure JI and Novak RJ. 2008. Diversity of Riceland Mosquitoes and Factors Affecting their Occurrence and Distribution in Mwea, Kenya. Journal of the American Mosquito Control Association, 24(3):349-358.

80. Muturi EJ, Muriu S, Shililu J, Mwangangi JM, **Jacob B**, Mbogo C, Githure J and Novak RJ. 2008. Blood feeding patterns of Culex quinquefasciatus and other culicines and implications for disease transmission in Mwea rice scheme, Kenya. Parasitology Research. 21(2):1329-1335.

81.. Mwangangi JM, Muturi EJ, Mbogo CM, **Jacob B,** Kabiru EW, Shililu JI, Githure JI and Novak RJ. 2008. Distribution of mosquito larvae within the paddy and its implication on larvicidal application in Mwea rice irrigation scheme, central Kenya. Journal of the American Mosquito Control Association. 24 (1):36-4

82.. Muturi EJ, Muriu S, Shililu J, Mwangangi J, **Jacob B** Mbogo C, Githure J and Novak RJ. 2008. Effect of rice cultivation on malaria transmission in central Kenya. American Journal of Tropical Medicine and Hygiene. 78(12): 270-275.

83.**Jacob B,** Muturi E, Mwangangi J, Funes J, Shililu J, Githure J and Novak RJ. 2007. Remote and field level quantification of vegetation covariates for malaria mapping in three rice agro-village complexesin Central Kenya International Journal of Health Geographics, 6:21-28.

84**.Jacob B.,** Muturi E, Mwangangi J, Wanjogu RK, Mpanga E, Funes J, Halbig P, Shililu J, Githure J, Regens JL and Novak RJ. 2007. Land use land cover change on Anopheles arabiensis (Diptera:Culicidae) aquatic habitats in Karima village, Mwea Rice Scheme, Kenya. J. American Journal of Tropical Medicine Hygiene. 76(11) 73-80.

85**.Jacob B**, Muturi EJ, Funes J, Githure J and Novak RJ. 2007. Association between land cover and habitat productivity of malaria vectors in central Kenyan ricelands. Acta Parasitology and Medical Entomology of China.45(4):22-36.

86.**Jacob B,** Muturi EJ, Funes J, Shililu J, Githure, Regens JL and Novak RJ. 2007. Using imaging technologies to control malaria. Imaging Notes 3(2):14-19.

87.Muturi EJ, Mwangangi J, Shililu J, Muriu S, **Jacob B**, Mbogo C, Githure J and Novak R. 2007. Evaluation of four sampling techniques for the surveillance of Culex quinquefasciatus (Diptera: Culicidae) and other mosquitoes in African rice agro-ecosystems. Journal of Medical Entomology, 44(13): 503-508.

88.Mwangangi J, Muturi EJ, Shililu J, Muriu S, **Jacob B**, Kabiru E, Mbogo C, Githure J and Novak RJ. 2007. Environmental covariates of Anopheles arabiensis in a rice agroecosystem. Journal of American Mosquito Control Association. 23(4) 13-22.

89.Muturi EJ, Mwangangi J, Shililu J, Muriu S, **Jacob B**, Kabiru E, Gu W, Mbogo C, Githure J and Novak RJ.2007. Mosquito species succession and the physico-chemical factors affecting their abundance in rice fields in Mwea, Kenya. Journal of Medical Entomology 44(2): 336-344.

90.. Muturi EJ, Shililu J, Gu W, **Benjamin Jacob**, John Githure and Robert Novak. 2007. Larval habitat dynamics and diversity of Culex mosquitoes in rice agro-ecosystem in Mwea, Kenya. American Journal of Tropical Medicine and Hygiene, 76(14): 95-102.

91.. **Jacob B,** Muturi EJ, Funes JE, Shililu JI, Githure JI, Kakoma II and Novak RJ. 2006. A grid-based infrastructure for ecological forecasting of rice land Anopheles arabiensis aquatic larval habitats. Malaria Journal, 5:91. 41-47.

92.Mwangangi J, Muturi EJ., Shililu JI, Muriu, S, **Jacob B**, Kabiru E, Mbogo C, Githure JI and Novak RJ. 2006. Survival of immature Anopheles arabiensis (Diptera: Culicidae) in aquatic habitats in Mwea rice irrigation scheme, central Kenya. Malaria Journal, 24:5:114.

93.Muturi E, Shililu J, Mwangangi J, Muriuki C, Mpanga E, Barasa P, **Jacob B,** Halbig P, Gu W, Mbogo C, Githure J and Novak R. 2006. Mosquito species diversity and abundance in relation to land use in a rice-land agro ecosystem in Mwea, Kenya. Journal of Vector Ecology, 31: 1-9.

94**.Jacob B,** Shililu J, Muturi EJ, Mwangangi JM, Muriu SM, Funes J, Githure J, Regens JL and Novak RJ.2006. Spatially targeting Culex quinquefasciatus aquatic habitats on modified land cover for implementing an Integrated Vector management (IVM) program in three villages within the Mwea Rice Scheme, Kenya. International Journal of Health Geographics, 5: 18-27.

95.Mwangangi J, Muturi EJ, Shililu JI, Muriu S, **Jacob B,** Gu W, Kabiru E, Mbogo C, Githure JI Novak RJ.2006. Dynamics of immature stages of Anopheles arabiensis and other mosquito species (Diptera: Culicidae) in relation to rice cropping in a rice agro-ecosystem in Kenya. Journal of Vector Ecology. 31 (2): 245-251.

96**.Jacob B,** Nelson PG, Lampman R, Morris J, Raim A, Funes J, LaPointe C and Novak RJ. 2006. Comparing GPS technology for identifying spatial ecological variation for urban mosquito management. Wing Beats (Journal of Mosquito Control Association) 16: 30-33.

97**.Jacob B,** Arheart KL, Griffith DA, Mbogo CM, Githeko AK, Regens J, Githure JI, Novak R and Beier JC.2005. Evaluation of Environmental Data for Identification of Anopheles (Diptera: Culicidae) Aquatic Larval Habitats in Kisumu and Malindi, Kenya. Journal of Medical Entomology .42: 751-755.

98.**Jacob B,** Regens JL Mbogo CM, Githeko AK, Githure JI, Novak RJ and Beier JC. 2005. Comparing the predictive power of field survey and Multispectral Thermal Imager (MTI) remote-sensed environmental data for the identification of Anopheles (Diptera: Culicidae) aquatic larval habitats in Kisumu and Malindi, Kenya, Journal of Medical Entomology, 42: 751-755.

99**Jacob B** Shililu J, Muturi EJ, Mwangangi JM, Muriu SM, Funes J, Githure J, Regens JL and Novak RJ. 2006.Spatially targeting Culex quinquefasciatus aquatic habitats on modified land cover for implementing an Integrated Vector management (IVM) program in three villages within the Mwea Rice Scheme, Kenya. International Journal of Health Geographics, 5: 18.

100.Chadee D, Lee R, Ferdinand A, Prabhakar P, Clarke D, **Jacob B.** Meningococcal meningitis outbreak in Trinidad. 2006. European Journal of General Medicine,3 3(2): 39-53.

101**. Jacob B,** Regens JL, Mbogo CM, Githeko AK, Keating J, SwaIm CM, Gunter, JT, Githure J and Beier JC.2003. Occurrence and distribution of Anopheles (Diptera: Culicidae) larval habitats on land cover change site in urban Kisumu and urban Malindi, Kenya. Journal of Medical Entomology 40 (6):7

**Services**

**B. Reviewer for the following Journals:**

**1.Journal**of**Geographic Information System (JGIS) [co-editor]**

2.American Journal of Computational and Applied Mathematics

3. American Journal of Tropical Medicine and Hygiene

4. Journal of Medical Entomology

5. Acta Tropica

6. American journal of Entomology [co-editor] \

In the past academic year I have reviewed 3 papers for Journal of GIS, 1 for Acta Tropca, 2 for American Journal of Mathematics, 1 for Journal of vector ecology and 4 for American Journal of Entomology

**C Academic Societies**

1. Member of Florida Mosquito Association
2. Healthy Start Coalition of Hillsborough County, Inc.
3. Consultant Ministry of Health Uganda
4. Consultant Ministry of Health Angola
5. Member of Kenya Medical Research Association [KEMRI]
6. American Mathematical Society