University of Mississippi
Medical Center

email: phillevn at gmail.com
personal website
LinkedIn
Google Scholar website

PHI LE

PROJECTS

Biostatistics/Bioinformatics

- Single Cell RNA sequence analysis (scRNAseq) and Colorectal cancer: We are working on a project to find pathways, clusters, etc. that are associated with Colorectal cancer (CRC)
- Differential Gene expression, Differential Transcript Expression, and Differential Transcript Usage: I give some details and pipeline how to do differential expression at the gene level and transcript level and also for Differential Transcript Usage. I also provided a different way to do DTE analysis by the DESeq method instead of Swish
- Time Series Analysis: I used time series to make predictions for new cases and new deaths of COVID-19 from Mar-Aug, 2020. My prediction was very close to actual cases within 20 days period
- Linear Mixed Effect model: I wrote a little program to find the estimates for linear mixed effect models by using the EM algorithm
- Did Increasing Continuity of Care Protect Patients with Chronic Disease from Emergency and Hospitalization Readmission? A Cohort Spatial-Temporal Study in Mississippi: We used spatial-temporal models to study the effects of locations on the risk of having Emergency visits and hospitalizations. This model is different from classical linear regressions in the sense that we account for the correlation effects of the neighborhood on locations due to Social Determinant Of Health factors
- Effect of disparities on continuity and healthcare utilization among patients with obesity-associated chronic conditions (OCC) and the subgroup with diabetes (OCC+T2D): In this project, we applied various different types of generalized linear regressions together meta-analysis method to study the disparities of healthcare utilization for patients living in TN, MS, LA
- SNPs and BMI changing associations from longitudinal functional GWAS study: We apply a functional longitudinal GWAS method to find the associations between SNPs and BMI changing over time. Our method is different from longitudinal methods because we consider coefficients for genotypes as a function instead of a number in the mixed effect models. I also write a pipeline to perform the analysis for a supercomputer in the Linux system
- Associations of location and continuity of care index to 30-day unplanned hospital readmissions of patients with obesity-associated chronic conditions in Central Mississippi: This is joint work with physicians and Geographic information system (GIS) experts. We are building a model to understand factors that affect the risk of 30-day unplanned hospitalizations by using different health-related variables from GIS within a distance from patients' locations and patients' health records. Our model is special since we consider the social determinant of health factors at some fixed distance from patients' locations, and we also account for the effects of correlations of physical neighborhoods

AI in Health Science

- Alzheimer severe prediction from MRI brain images: I did classify the severity of Alzheimer's Disease (AD) by using brain MRI images. I used a Bayesian CNN method to boost the accuracy rate, moreover, I also got the level of uncertainty of the predictions. The Bayesian method is important in the case that prediction input is not in the training population
- Pneumonia vs. normal from chest X-ray: I used Bayesian deep learning to classify pneumonia vs. normal from chest x-ray images. My project got a little better accuracy on a test set but just for a few epoch training and provide uncertainty level which is very important in medical prediction
- Blood cell detection and classification: In this project, I created a supervised deep learning model to detect and classify blood cell types in blood sample images

PROFESSIONAL SERVICES

- Journal Reviewer: Reviewer for Mathscinet Journal since 2016
- Founder/Organizer of Student Seminar at University of Mississippi Medical Center since 2021

EMPLOYMENT

Syracuse, NY	**Syracuse University**	**Fall 2016 – Spring 2018**

- Postdoctoral fellow in Pure Mathematics

EDUCATION

Jackson, MS	**University of Mississippi Medical Center**	**Fall 2018 – present**

- Ph.D. Research student at Department of Biostatistics and Data Science
- Advisor: Jeannette Simino

Columbia, MO	**University of Missouri Columbia**	**Fall 2011 – 2016**

- Ph.D in Mathematics

TEACHING EXPERIENCE

Jackson, MS	**University of Mississippi Medical Center**	**Fall 2018**

- Workshop: Using Linux and R
- Workshop: Introduction to single cell RNA analysis

Syracuse, NY	**Syracuse University**	**Fall 2016-Spring 2018**

- Calculus I, II, III
- Introduction to Partial Differential Equations
- Putnam coach for Mathematics team (my student got ranked 59th for all students across US and Canada)

Columbia, MS	**University of Missouri**	**Fall 2011 – Summer 2016**

- Courses: Calculus I, II, III

AWARDS

Jackson, MS	**University of Mississippi Medical Center**	**2018-present**

- Regions Research Award - School of Population Health, 2021
- Associated Student Body award in Education category, 2019

Columbia, MO	**University of Missouri Columbia**	**Fall 2011-Summer 2016**

- Invited to Hausdorff Research Institute for Mathematics, Bonn, Germany, for one month with full support – May 2014
- Highest scores for Ph.D Analysis Qualifying Exams in Mathematics – Spring 2011

PROFESSIONAL SERVICE

	University of Mississippi Medical Center	**2018-present**

- President of the UMMC chaper of American Statistics Association, 2019-2020
- Chair of Data Science Officer of School of Population Heath in the UMMC Associated Student Body, 2019-2020

SCIENTIFIC TALKS/PRESENTATIONS

- Symposium on Data Science & Statistics (SDSS), Virtual June 2-4, 2021 (Lighting talk in Data-Driven Healthcare): Did Increasing Continuity of Care Protect Patients with Chronic Disease from Emergency and Hospitalization Readmission? A Cohort Spatial-Temporal Study in Mississippi

- SGIM Southern Meeting, Feb 2021 (Poster): Does continuity of care protect patients with Obesity-Associate Chronic Conditions from Hospitalizations and Emergency Department visits?
- Northeast Analysis Network, Syracuse University, Sep 22, 2017: L^p risk wavelet density estimates for bias data, .
- Analysis seminar, Syracuse University, Oct 7, 2016: Recent progress for degenerate elliptic equations,
- Fall Eastern Sectional Meeting 2016, Bowdoin College, Brunswick, MESep 24-25, 2016: BMO solvability and absolute continuity of harmonic measure,
- Analysis Seminar, University of Missouri-Columbia, March 8, 2016: BMO solvability and absolute continuity of harmonic measure,
- SEAM 2016, University of South Florida, March 12-14, 2016: BMO solvability and absolute continuity of harmonic measure,
- Prairie Analysis Seminar 2015, Kansas State University, Sep. 25-26, 2015: *Quasi-linear PDEs and uniform rectifiability*,
- AMS Central Sectional Meeting, Michigan State University, Mar. 13-15, 2015: L^p *bounds for Riesz transforms, square root functions associated to degenerate elliptic operators*,
- SEAM 2015 - The 31st Southeastern Analysis Meeting, University of Georgia - Athens, Mar. 8-10, 2015: *Carleson measure estimates and the Dirichlet problem for degenerate elliptic equations*
- The Fifth Ohio River Analysis Meeting, Cincinnati, Ohio, Feb. 28 - Mar. 1, 2015: *Carleson measure estimates and the Dirichlet problem for degenerate elliptic equations*,
- Workshop on Harmonic Analysis, Partial Differential Equations and Geometric Measure Theory, ICMAT, Campus de Cantoblanco, Madrid January 12 - 16, 2015: *Some recent development for degenerate elliptic operators*,

PUBLICATIONS

Mathematics, Biostatistics and
Health Science

- Did increasing continuity of care protect patients with chronic disease from emergency and hospitalization readmission? A cohort spatial-temporal study in Mississippi (first author, preprint)
- Effect of disparities on continuity and healthcare utilization among patients with obesity-associated chronic conditions (OCC) and the subgroup with diabetes (OCC+T2D) (first author, preprint)
- Continuity of Care for Patients with Obesity-Associated Chronic Conditions: Protocol for a Multisite Retrospective Cohort Study, with others, JMIR Res Protoc 2020;9(9):e20788
- Sharp affine Trudinger-Moser inequalities: A new argument, with N Duy and N Lam, Canadian Mathematical Bulletin, 1-14, 2020
- Quantum divergences with p-power means, with N Lam, Linear Algebra and its Applications 609, 289-307, 2020
- Hardy Inequalities and Caffarelli-Kohn-Nirenberg inequalities with radial derivative, with Nguyen Tuan Duy, Weijia Yin , 2020 Journal of Mathematical Inequalities, to appear
- Sharp Trudinger-Moser inequalities with homogeneous weights, with Duy, Nguyen Tuan; Nghia, Le Trung; Electron J. Differential Equations 2019, N. 205
- Carleson measure estimates and the Dirichlet problem for degenerate elliptic equations, with Steve Hofmann and Andrew Morris, ANALYSIS & PDE, Volume 12, No. 8, 2019
- BMO solvability and absolute continuity of harmonic measure, with Steve Hofmann, The Journal of Geometric Analysis, Volume 28, Issue 4, pp 3278–3299
- Uniform Rectifiability and harmonic measure IV: Ahlfors regularity plus Poisson kernels in Lp implies uniform rectifiability, with Steve Hofmann, Kaj Nystrom, Jose Maria Martell, Analysis and PDEs. Vol 10. No. 3 2017
- Nonlinear versions of Stampacchia and Lax-Milgram theorems and applications, with Duong M. Duc and Nguyen H. Loc, Nonlinear Anal. 68 (2008), no. 4, 925931

FUNDING

- Investigator: CORNET project ($75,000), 2018 - 2020

COMPUTER LANGUAGES AND SKILL

- How to google what I need
- Thinking about "strange" ideas that no one did during my free time
- Building machine learning, deep learning, computer vision models for health science researches
- Computer language skill: Tensorflow, Tensorflow Probability, Keras, Scikit-learn, pytorch, SQL; SAS; R; Python; STATA; Julia (Beginning); Linux;Windows; MacOS; High Performance Computing; Google map APIs
- Genomics statistical analysis: GWAS, Functional GWAS (fGWAS) methods
- Bio-informatics: Differential Gene Expression (DESeq2 method), limma, EdgeR, Differential Transcript Expression (Swish, DESeq2 methods), Differential Transcript Usage (DRIMSeq + StageR method)