Guifang (Vivian) Zhou

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Qualifications

Doctoral candidate in mathmatics with 10+ years of experience in problem formulation, model development, methodology selection and result interpretation

- Solid mathematical background (modeling, simulation, optimization, prediction)
- Strong statistical modeling skills (correlation, hypothesis testing, multivariate analysis, general linear models, monte carlo)
- Familiar with data mining, machine learning algorithms (clustering, classification, regression)
- Experienced in progamming languages (C++, Matlab, SAS, R, Fortran)
- Great collaborative / communication experience with biologists, engineers and physicists
- Ability and great desire to learn new skills

Education

Ph.D. Mathematics	Florida State University	*2012–2015*
M.S. Mathematics	Florida State University	*2009–2012*
M.S. Applied Mathematics	Anhui University	*2006–2009*
B.S. Mathematics	Anhui University	*2002–2006*

Work Experience

Research Assistant, Florida State University *08/2013–Present*
Design and develop a cross-platform software package using QT, CLAPACK and VTK. Provide users new methods and tools for visually and quantitatively charaterizing the relationship within and among big sets of topologies. Network analysis were employed to uncover the relationship between phylogenetic trees

Teaching (Distinguished Teaching Award Winner), Florida State University *08/2009–5/2015*
Solo instructor for pre-calculus, calculus I, II and calculus III; Teaching assistant for college algebra, calculus for business, analytical trigonometry

Selected Projects

Rank-Constrained Optimization,

- Developed, analyzed and evaluated new methods to solve the rank-constrained optimization problem with a Riemannian manifold approach
- Applied new algorithms on real applications, e.g., weighted low-rank approximation and graph similarity problems
- Developed and implemented libraries in MATLAB and C++ for new algorithms

Facial Recognition,

- Employed principal component analysis (PCA) and simple projection to people facial images
- Classified and labeled new images using similarities
- PCA achieved ∼90% successful retrieval rate while simple projection achieved ∼60% successful retrieval rate

Bayesian Analysis of Noisy Images,

- Performed Bayesian approach for noise reduction in image processing
- Applied Gibbs sampler to generate samples from Markov random field models
- Investigated impacts of variations on image recovering procedure

Neural Decoding by Poisson Model,

- Performed statistical modeling (general linear model, Poisson process) on neural activity from brain cortex data
- Applied maximum likelihood and sequential Monte Carlo methods to estimate model parameters
- Explored brain mechanism and made inferences about the external behavior

Phase-Amplitude Analysis by Clustering ,

- Analyzed time-dependent neural information to explore brain activity
- Adopted functional data analysis to separate phase-amplitude components of given data
- Used clustering tools to explore potential connections in neural data

Publications and Selected Presentations

- Rank-Constrained Optimization: A Riemannian Manifold Approach (accepted by European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning 2015)
- TreeScaper: Software to visualize and understand tree landscapes, *2014 iEvoBio meeting*, Raleigh, NC, 2014

Technical Skills

C++, Matlab, SAS, R, Fortran, Latex

Selected Courses

Computational Statistics, Method in Applied Math, Foundations of Computational Mathematics, Time Series and Forecast, Data Management and Analysis with SAS, Functional Data Analysis