SIAMAK RABIENIA

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PROFESSIONAL PROFILE

Dedicated Applied Statistician and self-motivated PhD in Mathematics with more than 7 years of innovative research experience with demonstrated success in solving complex problems and more than 4 years of well-developed working experience in industrial segments. Certified in **Applied Management Principles (AMP)** with proven leadership-oriented abilities and 3 years of extensive experience in team building & management, decision-making, and public speaking & presentations. **Seeking Data Science/Analytics** roles. **Open to Relocation.**

EDUCATION

Ph.D. Mathematics
Purdue University, West Lafayette, IN, May 2020.
Thesis Focus: "Inverse Problems – Dynamic X-ray Tomography – Inverse Scattering Theory." *GPA*: 3.91

Graduate Minor, Applied Statistics
Purdue University, West Lafayette, IN, May 2018.
Relevant Courses: Design of Experiment, Statistical Inference, Applied Multivariate Statistics, Probability & Applications.

Master of Science, Mathematics
Purdue University, West Lafayette, IN, Dec 2014.

Exchanging Scholar, Applied Mathematics
Florida Institute of Technology, Melbourne Florida, 2011-2012.

Master of Science, Mathematics
Sharif University of Technology, Tehran, Iran, June 2011.
Thesis: "Solutions of Reaction-Diffusion Systems with Predator-Prey Model Interaction Terms."

Bachelor of Science, Mathematics
Shahid Beheshti University, Tehran, Iran, June 2008.

SKILLS

Statistical
- Data assessment for quality measures such as completeness, accuracy, and applicability – Data Management using **SQL**
- Quantification – Statistical Data Analysis using **SAS** and **R** – Statistical Visualization using **R** and **Tableau**
- Statistical Machine Learning/Bias-Variance tradeoff using **Python** – Asymptotic/Cross-Validation optimization techniques
- Cluster Sampling – Parametric and Non-parametric Kernel Density Estimations methods
- Foliage classification of LiDAR point cloud data – Dynamic **Principal Components Analysis (PCA)**

Mathematical
- **Dynamic Computed Tomography (CT Scan)** – **Radon, X-ray,** and **Light-Ray** transforms, Partial Differential Equations
- Biharmonic/Schrödinger equations – Reconstruction of potential and magnetic fields utilizing the scattering amplitude
- Wave propagation – Landweber Iterative Image Reconstruction technique
- **Fourier Spectral Analysis** and **FFT-based Signal Analysis**

Smart Structures
- Thermal stress management of engineered multilayered structures – **Sensitivity Analysis**
- **Time-frequency Analysis** of the dynamical behavior of Real-Time Hybrid Structures.
- Nonlinear Normal Modal in vibrating systems and formulation of the solution of equations of motion
- Cyber-physical smart structures and identification of the stability switch moment, **MatLab** Simulations

PROFESSIONAL APPOINTMENTS

May 2018 - Aug 2018
Data Analyst – Oak Ridge Institute for Science and Education (ORISE)
- Assessed the effectiveness and accuracy of data source and data acquisition techniques
- Developed a novel algorithm to estimate P- & S-waves arrival-times by interpolating the moisture intervals in data set
- Quantified the degree of variability through the Non-parametric Kernel Density Estimations method and clustering
- Optimized the Bandwidth for PDF estimations by employing the Asymptotic & Cross-Validation techniques
- Explained the variability of the mechanical properties of soil utilizing the Statistical Analysis and MatLab Visualization
- Proposed a new data gathering platform to the experimental team to reduce hardware and human errors

Jun 2016 - Jul 2016
Sensitivity Analyst – Sandia National Laboratories
- Developed a thermal deformation model by including temperature dependence of material properties & layer gradation
- Conducted the Sensitivity Analysis on the developed model of thermal deformation
- Showcased the model optimization & uncertainty investigations through several MatLab Simulations
- Prototyped the design suggestion for software engineers team for implementation & benchmarking

Apr 2006 - May 2010
IT Project Manager – Computer and Mechanized Systems (LLC), Tehran, Iran.
- Managed IT operations in conjunction with the parent company to improve performance, costs, and end-user satisfaction
- Worked with the management team to develop an overall IT strategy, planning process, and investment strategies
- Supervised individuals by allocating specific projects and monitoring the progress against agreed quality and performance

RESEARCH EXPERIENCE

Classification of LiDAR Point Cloud Using Semi-Supervised Machine Learning
- Performed K-d Tree data structure to determine the K-Nearest Neighbor classifiers for 9-million LiDAR point
- Developed the Local Point Density Indicators by defining the Linear/Planar/Volumetric Dimensionality Descriptors
- Utilized a Dynamic Principal Components Analysis (PCA) to explain the spatial distribution of LiDAR data
- Improved the accuracy of 3D geometrical object recognition by implementing several MatLab Simulations

Dynamical X-Ray Tomography (Supported by NSF)
- Coordinated research on "Dynamic Radon Transforms & Landweber Iterative Image Reconstruction" Algorithm
- Established local and microlocal properties of a 2D dynamic X-ray transform
- Developed Global Bolker condition for Dynamic Inverse Operators using micro-localization method
- Succeeded in establishing the global uniqueness & stability estimate results for Dynamic Inverse Operators

Vectorial Light-Ray Transform on Minkowski Spaces (Supported by NSF & PRF)
- Executed a research study on "The Vectorial Light-Ray Transform on Minkowski Spaces"
- Developed the local & analytic microlocal invertibility by employing the analytic microlocal analysis arguments
- Established a Helgason-type support theorem for the geodesic Light-ray transform of vector fields in Minkowski Spaces

Wave Propagation, Inverse and Near-field Scattering (Supported by NSF)
- Conducted a research project on "Inverse Scattering for the Perturbed Biharmonic Operator"
- Established the high-frequency asymptotic expansion of the scattering amplitude using far-field pattern
- Demonstrated the unique recovery of the potential and the curl of the magnetic field using the scattering amplitude

Cyber-Physical Systems and Non-linear Vibrations (Supported by NSF)
- Performed a Time-frequency analysis for the dynamical behavior of non-linear vibrating systems in smart structures
- Formulated a generic closed-form solution of equations of motion for nonlinear normal modal
- Identified the critical moment for the stability switch of cyber-physical structures and MatLab Simulations

Elliptic Partial Differential Equations and Reaction-Diffusion Systems
- Conducted a project on "Two Reaction-Diffusion Predator-Prey models"
- Developed the Reaction-Diffusion system by including Leslie and Holling type II functional responses
- Explained and formulated the solution of Reaction-Diffusion system

AWARDS & CERTIFICATES

National Science Foundation-Mathematical Sciences Graduate Internship Fellowship (NSF-MSGI) – $12000

National Science Foundation Travel Award for AIP 2015 – $1650

R Programming – authorized by Johns Hopkins University – Coursera License: R2TMZBKB4RE4

Applied Management Principles (AMP) – 5.5 Continuing Education Units – Purdue Krannert School of Management

Purdue **Bilsland Outstanding Dissertation Fellowship** – $21650, 1-year tenure

Purdue Research Foundation (PRF) Grant – $18000, 1-year tenure

Purdue **2017 Emerging Leadership Award**

Florida Tech President Scholarship – $4000

Honorable Mention – International Mathematics Competitions (IMC 2008)

Ranked 11th among more than 15,000 mathematics students in Iran's nationwide graduate school entrance exam

Distinguished Student & Ranked 1st Award among more than 2000 students, Parseh Institute of Higher Education, Iran.

LEADERSHIP & COMMUNITY INVOLVEMENTS

Apr 2019 — **Reviewer – International Conference on Physics, Mathematics and Statistics (ICPMS 2019)**

Sep 2017 - May 2018 — **Member of Board – Purdue Student Fee Advisory and Organization Grant Allocation (SFAB & SOGA)**
- Allocated more than $600K to Purdue student organizations to promote various educational and cultural programs

Sep 2016 - Aug 2017 — **President – Iranian Cultural Club, Purdue University**
- Supervised graduate students in collaboration with Student Activity Organization (SAO) & International Programs
- Increased organization's funding by %36 by securing more than $22000 including Purdue's unanimously voted funding

Mar 2017 — **Referee – Lafayette Regional Science and Engineering Fair, Purdue University**

Aug 2015 - May 2016 — **Graduate Student Coordinator – Department of Mathematics, Purdue University**
- Co-organized the Mathematical Sciences Graduate Research Day and Student Colloquium Seminars

Apr 2012 — **Assistant Organizer – Florida Institute of Technology**
- Facilitated the first emergency preparedness for severe geomagnetic storms
- Collaborated with Florida Division of Emergency Management and Federal Emergency Management Agency