Peixuan Zhang

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Driven, passionate, and hard-working Ph.D. student conducting multiple research projects on Stochastic Optimization, Convex optimization and Machine Learning. Seeking a position as a research scientist, machine learning engineer, data scientist in a dynamic environment that fosters continuous development and embraces challenging opportunities.

EDUCATION

Ph.D. student, Industrial Engineering, *Pennsylvania State University, USA*   2020 – Present
Research interests: Stochastic optimization, Variational Inequalities, Stochastic Simulation, Machine Learning, Reinforcement learning, Stochastic calculus, Linear/Nonlinear programming, Statistics and Probability theory.
Master of Science, Statistics, *University of Minnesota, Twin Cities, USA*   2017 – 2020
Bachelor of Science, Mathematics, *Dalian University of Technology, China*   2013 – 2017

ACADEMIC EXPERIENCE

Research Assistant / Algorithm for stochastic compostional convex problems   **Oct 2021 – Present**
Programming: Matlab & Python   *PSU, State College, USA*

- Proposed novel **Augmented Lagrangian (AL) schemes** for resolving non-smooth stochastic convex optimization problems with convergence and rate guarantees.
- Smoothed AL scheme designed to work well with stochastic problems where constraints have a **compositional or hierarchical structure**.
- Applications demonstrated in **stochastic hierarchical games, asset allocation problems, and risk-averse optimization problems**.
- Prepared of scientific journal publications as a collaborating author.

Research Assistant / Global resolution of Chance Constrained Optimization   **Oct 2021 – Present**
Programming: Matlab & Python   *PSU, State College, USA*

- Established an equivalent convex representation of chance-constrained optimization problem under suitable assumptions.
- Proposed a variance-reduced Stochastic Proximal-point scheme to obtain a global optimal solution with complexity guarantees.
- One conference paper got accepted and prepared of scientific journal publications as a collaborating author.

Research Assistant / Suicidal thoughts prediction   **Jan 2019 – Present**
Programming: R & Python & Matlab   *UMN, Minneapolis, MN*

- Employed a variety of machine learning techniques such as **linear regression, GLM (logistic regression), SVM, and Random Forest** to large-scale data from a five-year National Survey on Drug Use and Health.
- Created and presented models for prediction of suicidal thoughts with causal discovery feature selections, **including HITON_PC, Fisher, and stepwise.**
- Predicted suicidal thoughts and attempts with great **AUC values reaching around 0.90** after cross validation and hold out validation.
- Composition of novel scientific journal publications in collaboration with other university scholars.

CONFERENCE TALK

A Smoothed Augmented Lagrangian Method for Nonsmooth Deterministic Convex problems.
Siam Conference on Optimization (OP23)   Seattle, USA
A Smoothed Augmented Lagrangian Method for Stochastic Convex Problems with Compositional Constraints.
The International Conference on Continuous Optimization (ICCOPT 2022)   Bethlehem, USA

WORK EXPERIENCE

PhD research intern - Optimization for Renewable Energy   **July 2023 – August 2023**
National Renewable Energy Laboratory, CO

- Investigated Optimal Transmission Switching problems with the AI, Learning Intelligent Systems Group at NREL.
- Built benchmarking models for Mixed Integer Nonlinear Problems in **Julia** with **HPC** system.
- Compared different MINLP solvers including BOMIN, COUENNE, SHOT, Juniper on instances from PGlib.
- Prepared conference paper as collaborating author.

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Survey Researcher intern/ Non-response Bias Analysis   **Jan 2020 – Jul 2020**

Public Health Department of Hennepin County   *Minneapolis, MN*

- Provided an **independent evaluation of non-response bias** in a survey analysis of the SHAPE project, a population health data survey program to improve community health and achieve health equity for the community.
- Conducted data analysis on **over 11,143 survey responses** and estimated the non-response bias by using both **R and SPSS.**
- Improved the survey design for corresponding SHAPE project efforts by supplementing questionnaire enhancements for production of higher quality quantitative data.

PUBLICATION

- **Peixuan Zhang**, Uday V. Shanbhag, Constantino M. Lagoa, Ibrahim Ekrem Bardakci " Global Resolution of Chance-Constrained Optimization Problems: Minkowski Functionals and Monotone Inclusions" 2023 62nd IEEE Conference on Decision and Control (CDC). (Accepted)

- Adishesha, Amogh Subbakrishna, Lily Jakielaszek, Fariha Azhar, **Peixuan Zhang**, Vasant Honavar, Fenglong Ma, Chandra Belani, Prasenjit Mitra, and Sharon Xiaolei Huang. "Forecasting User Interests Through Topic Tag Predictions in Online Health Communities." IEEE Journal of Biomedical and Health Informatics (2023).

- Lu, Dawei, **Peixuan Zhang**. "A New General Asymptotic Formula and Inequalities involving The Volume of The Unit Ball". Journal of Number Theory 170 (2017): 302-314.

SKILLS

Tools and Languages	Matlab, Python (Tensorflow, PyTorch), R, SQL, LaTeX, MarkDown, SQL, SAS, Julia, Github, CUDA
Communication	English (Professional Proficiency), Chinese (Native).

ACTIVITIES

- Penn State Student Chapter of the Institute for Operations Research and Management Sciences   2022

    – Serve PSU INFORMS as Webmaster & Secretary.
    – Create and manage the content and organization of INFORMS PSU website.
    – Organize monthly activities to advertise faculty and students research using or developing OR/MS and Analytics tools.

- Penn State Graduate Women in Engineering   Apr 2022 – Present

    – Active member.

- Penn State Data Science Community   Aug 2022 – Present

    – Volunteer for PS Data Science community.
    – Creation of a working group or community of practice.
    – Initiatives around support for women in data science.