Alina Gorbunova

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Education

Georgia Institute of Technology **Atlanta, GA**

PhD in Industrial Engineering, concentration in Systems Informatics and Control (GPA: 3.67/4.0) Aug. 2022 - Present

Advisors: Dr. Jianjun Shi and Dr. Kamran Paynabar

Relevant Courses: Linear Optimization, Math of Operations Research, Statistical Methods for Manufacturing Design, Stochastic Processes I, Production and Service Systems Engineering, High Dimensional Data Analytics

Rutgers University - New Brunswick **New Brunswick, NJ**

Bachelor of Science in Industrial Engineering, graduated summa cum laude (GPA: 3.84/4.0) Sept. 2018 - May 2022

Relevant Courses: Engineering Statistics, Deterministic Models in OR, Probabilistic Models in OR, Simulation Models, Facility Layout & Material Handling, Industrial Informatics, Manufacturing Processes (with Lab), Quality Engineering (with Lab), Production Control

Research Experience

Georgia Institute of Technology

Federated Learning for Multi-Short Run Production Baseline Generation May. 2023-Present

- Proposed using **federated learning** to create phase I baselines for monitoring short run production quality for multiple short run production processes
- Created a framework that uses **Gaussian Mixture Models** to cluster processes through feature selection that preserves data privacy while creating effective baselines

High Dimension (HD) Profile Monitoring for Process Monitoring Sept. 2023-Present

- Extended the use of **tensor decomposition** to solve for process parameters in linear HD models to nonlinear HD models
- Used **alternating least squares** and **block coordinate descent** to overcome computational efficiency challenges with HD data
- Created a methodology that uses residuals to monitor changes in process parameters, showing promising results for both linear and nonlinear models

Rutgers University

Exploring Reliability in DC Brush Motors Sept. 2019-May 2020

- Recipient of the New Jersey Space Grant Consortium from NASA
- Designed and built **Arduino** circuits to collect and analyze failure data of rotors with **MATLAB** code
- Created models of propellor blades in **Solidworks** for 3D printing and compared failure data to mass produced blade

Teaching Experience

Rutgers University, Honors Academy **Piscataway, NJ**

Design Advisor (Class Advisor specific role) May 2021 -May 2022

- Worked closely with Honors Academy Dean to create syllabus, **Canvas** class page, and assignments for Intro to Engineering and Design and Development classes
- Organized and delegated grading for classes by creating rubrics and dividing assignments between other Design Advisors
- Presented workshops on equity centered community design and research to Intro to Engineering class

Rutgers University, Academic Support Services for Student Athletes **Piscataway, NJ**

Tutor Sept. 2019-Dec. 2019

- Tutored athletes one on one in engineering statics and multivariable calculus
- Created study guides and practice problems for upcoming exams and quizzes

Leadership Experience

Georgia Institute of Technology

- Member of the Graduate Student Advisory Council — Fall 2023-Present

Rutgers University

- Internal Vice President (executive board) of Phi Sigma Rho, Xi Chapter — Fall 2021-Spring 2022
- Secretary (executive board) of Phi Sigma Rho, Xi Chapter — Fall 2020-Spring 2021
- Fundraising Chair of Phi Sigma Rho, Xi Chapter — Fall 2019
- Vice President of Alpha Pi Mu, Industrial Engineering Honors Society — Fall 2021-Spring 2022

Honors & Awards

Georgia Institute of Technology

- National Science Foundation (NSF) Graduate Research Fellowship — Fall 2023-Present
- John Morris Fellowship — Fall 2022-Spring 2023
- Women in Engineering Graduate Leadership Fellowship — Fall 2023-Present

Rutgers University

- Rutgers National Scholarship — Fall 2018-Spring 2022
- Engineering Honors Academy — Fall 2018-Spring 2022
- Dean's List — All semesters

Skills & Certifications

- Microsoft Office
- MATLAB
- Python, Java
- Solidworks, AutoCAD
- SQL, R, JMP
- Tableau, PowerBI

Received IISE Lean Six Sigma Yellow Belt

Projects

Algae Biofertilizer System — Jan. 2021-Dec. 2021

Goal: Develop a system that optimizes the growth of algae and turns it into a biofertilizer

- Conducted literature and market research to pick ideal algae and learn its optimal conditions
- Built tank and tray system to grow algae in wastewater and dry grown algae into fertilizer
- Ran experiments to compare algae biomass growth in control versus optimal growth conditions
- Used **Arduino** sensors to monitor tank conditions during algae growth
- Collected soil samples with algae fertilizer to validate biofertilizer usage

Wind Turbine Electric Power Forecasting — Jan. 2021-May 2021

Goal: Create models to forecast wind turbine electric power output using existing data

- Conducted preliminary analysis to determine variable correlation
- Built and tested models in **R** to determine model with lowest root mean squared error
- Trained best model using existing wind speed and temperature data
- Forecasted future wind speeds to predict predicted wind power

Industry Experience

Otis Elevator Company — **Florence, SC**

Quality Engineering Intern — May 2021-August 2021

- Created **PowerBI** dashboard of real time production data to pinpoint process bottlenecks
- Established quality control for new production line with **PFMEA** and **Control Plan** documents
- Spearheaded implementation of paperless quality control check sheets
- Managed supplier defect parts inventory by contacting suppliers and repairing parts to save $10,500
- Conducted internal audit of production cells in preparation for **ISO 9001:2015** & **14001:2015** audits

Manufacturing Engineering Intern June 2020-August 2020

- Expanded daily efficiency calculator to hourly efficiency calculator in **Excel**
- Streamlined **Excel** employee training documents to reduce input time for information by 45%

Academy of Art of Highland Park **Highland Park, NJ**

Junior Instructor (Senior Staff) Jan. 2018-Dec. 2019

- Managed groups of employees and volunteers while delivering individual drawing and painting lessons to all age groups
- Performed administrative work such as creating safety protocol and new training programs
- Organized and planned staff meetings and safety meetings

Friday Work Crew Manager Jan. 2019-Dec. 2019

- Managed five workers in the art studio as they did weekly maintenance every Friday
- Led weekly safety meetings and implemented new safety and studio protocols