# Ashkan Mirzaee

Email: ashkan.m23@gmail.com

Website | GitHub | GitLab | LinkedIn | Google Scholar

## Education

**Ph.D., Industrial Engineering and Operations Research** *May 2022*

**Minor**: Statistics

University of Missouri, Columbia, MO

- Thesis: *Impacts of woody biomass production and biopower generation on US forests*

**M.S., Industrial Engineering and Operations Research** *May 2017*

University of Missouri, Columbia, MO

- Thesis: *Alternative methods for calculating optimal safety stock levels*

## Experience

**Data Scientist** *January 2022 - present*

Ford Motor Company, Dearborn, MI

- Developed AI/ML forecasting tool for supplier shipments, targeting semiconductor-part constraints using historical data analysis.
- Achieved cost-saving opportunities by implementing cloud computing and data visualization tools like SQL BigQuery and Looker Studio to identify components lacking raw material index tracking.
- Utilized mathematical linear programming and Python's OR-Tool to generate production purchasing strategy forecasts, optimizing production purchasing strategies.
- Employed Python machine learning techniques and the Google Cloud Platform to forecast steel market prices, aiding in future steel procurement budgeting.
- Leveraged Python-based data analytics projects, combining machine learning, cloud computing, and Git version control to drive sustainable strategic insights.

**Graduate Research Assistant** *January 2016 - December 2021*

University of Missouri, Columbia, MO

- Analyzed US forest sustainability to determine optimal woody biomass production levels with minimal environmental impact.
- Conducted statistical analysis to evaluate the impact of woody biomass production on forest ecosystems, employing R, Python, and high-performance computing techniques.
- Improved safety stock forecasting methods for Anheuser-Busch's supply chain optimization by researching and analyzing large inventory datasets.
- Created a Python API for efficient, parallel access to the Forest Inventory and Analysis (FIA) database.
- Developed *Sbox*: a Python toolbox for facilitating users' interactions with HPC clusters.

## Computing

- *Programming:* Python, R, Bash, SQL, GAMS
- *HPC Clusters:* Linux, Slurm, Spack, Singularity
- *Cloud computing:* Google Cloud Platform, BigQuery, Kubernetes
- *Libraries:* OR-Tool, MathOpt, SQLite, Pandas, PySpark, Shapely, Numba, nlme, plm, *sf*, parallel
- *Miscellaneous:* Git, Conda, Docker, Regular expression, Looker Studio

## Publications

- **Ashkan Mirzaee**, Ronald McGarvey, and Francisco Aguilar. "Feasibility of satisfying projected biopower demands in support of decarbonization interventions: A spatially-explicit cost optimization model applied to woody biomass in the eastern US". *Energy Economics* (2024)
- **Ashkan Mirzaee**, Ronald McGarvey, Francisco Aguilar, and Erin Schliep. "Impact of biopower generation on eastern US forests". *Environment, Development and Sustainability* (2022)
- Paul Picciano, Francisco Aguilar, Dallas Burtraw, and **Ashkan Mirzaee**. "Environmental and socio-economic implications of woody biomass co-firing at coal-fired power plants". *Resource and Energy Economics* (2022)
- Francisco Aguilar, **Ashkan Mirzaee**, Ronald McGarvey, Stephen Shifley, and Dallas Burtraw. "Expansion of US wood pellet industry points to positive trends but the need for continued monitoring". *Nature: scientific reports* (2020)
- **Ashkan Mirzaee**, and Mohamed Awwad. "Shortest Path Algorithm in the Presence of Polyhedral Forbidden Regions". In IIE Annual Conference. Proceedings. *Institute of Industrial and Systems Engineers* (2017)
- **Ashkan Mirzaee**. "Alternative methods for calculating optimal safety stock levels". *University of Missouri-Columbia* (2017)

## Contributed Talks

- Optimal Level of Wood Biopower Generation in the US East Considering Local Forest Impacts. INFORMS Annual Meeting, Indianapolis, IN (2022)
- Sbox: simple toolbox for Slurm, SC21, St Louis, MO (2021)
- Impact of biopower generation on US forests. INFORMS Annual Meeting, Anaheim, CA (2021)
- A Python API for accessing Forest Inventory and Analysis database in parallel, PEARC21 (2021)
- Impact of increased biomass electricity generation on forest health. INFORMS Annual Meeting (2020)
- $CO_2$ Emissions reduction by identifying optimal level of co-firing biomass in coal-burning power plants. INFORMS Annual Meeting, Seattle, WA (2019)
- Woody biomass use for biopower and its impact on forest resources. INFORMS Annual Meeting, Phoenix, AZ (2018)
- Shortest path algorithm in the presence of polyhedral forbidden regions. IISE Annual Conference, Pittsburgh, PA (2017)
- Alternative methods for calculating optimal safety stock levels. CELDi Conference, Atlanta, GA (2016)

## Awards and Affiliations

- 2023 Henry Ford Technology Awards, Finalist (2023)
- Innovative Design Competition, 1st place award, IISE Annual Conference (2017)
- Mizzou Advantage Graduate Award, University of Missouri (2017)
- Outstanding IMSE Masters Student Award, University of Missouri (2017)
- Institute for Operations Research and the Management Sciences (INFORMS)
- Alpha Pi Mu, Industrial Engineering Honor Society
- US Research Software Engineer Association
- Software Carpentry Trainer
- XSEDE Student Champions