## Changyu Gao

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## EDUCATION

University of Wisconsin-Madison

Madison, WI Ph.D. Student in Industrial Engineering, Optimization Track Sep 2019 - Present

University of Wisconsin-Madison

M.S. Student in Computer Science

University of Science and Technology of China

B.S., Mathematics and Applied Mathematics (Outstanding Graduate)

Hefei, China Aug 2015 - June 2019

Madison, WI

Feb 2021 - Present

Experience

Research Assistant, University of Wisconsin-Madison

Nov 2019 - Present

Madison, WI

Supervisor: Stephen Wright

- Parameter Learning with DFO methods: Implemented the parameter learning procedure for Lorenz96 model using derivative-free optimization methods in Python. Performed optimization with uncertainty function values using soft interpolation and Bayesian methods.
- Subseasonal Climate Forecasting: Improved the parameter estimation with ensembles. Investigated the sensitivity of the dynamic systems. Implemented model reduction methods in Python.
- Differentially Private Optimization: Investigated differentially private optimization methods.

Applied Scientist Intern, Amazon

Seattle, WA

Team: Delivery Experience (DEX) – AI

May 2021 - Aug 2021

- Mining Inconsistency Issues using Semantic Search Model:
  - \* Applied the semantic search model to the customer contact data, facilitating inconsistency detection.
  - \* Collected and refined the queries for semantic search; oversaw the data annotation process.
  - \* Implemented two fine-tuning schemes of the encoder used in the semantic search model in Tensorflow and thus improved the search model accuracy.
  - \* Important inconsistency issues discovered were escalated to the corresponding issue owners.

Research Assistant, University of Science and Technology of China

Hefei, China

Advisor: Liansheng Zhuang

Mar 2019 - May 2019

• Complex-valued Neural Network: Surveyed various types of complex-valued neural networks. Implemented Associative LSTM in Keras. Validated the performance of the complex-valued neural network with experiments in Python.

## Selected Projects

**Distribution System Optimization:** Modeling of two-stage optimization of the distribution system. Implemented in GAMS and Python. Data is collected and cleaned using BeautifulSoup and Pandas.

Knapsack Problem: Implemented various algorithms to solve the problem: depth first search, best first search and dynamic programming. Implemented branch and bound method to prune the search space.

## Programming Skills

Languages: Python, SQL, MATLAB, R, C, C++, Java Frameworks: Tensorflow, Pytorch, Pandas, Numpy, Scipy