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 Madison, WI
M.S. Student in Computer Science *Feb 2021 – Present*

University of Science and Technology of China Hefei, China
B.S., Mathematics and Applied Mathematics (Outstanding Graduate) *Aug 2015 – June 2019*

Experience

Research Assistant, University of Wisconsin–Madison Madison, WI
Supervisor: **Stephen Wright** *Nov 2019 – Present*

- **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