

# Weizhe Yuan

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## EDUCATION

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<b>Carnegie Mellon University - School of Computer Science</b>	Pittsburgh, PA
Master of Computational Data Science GPA: 3.80/4.0	May 2021
<b>Columbia University</b>	New York City, NY
Summer Term Undergraduate Visiting(Non-degree) GPA: 4.165/4.0	Jul. - Aug. 2018
<b>Wuhan University - School of Civil Engineering</b>	Wuhan, China
Bachelor of Engineering in Civil Engineering Rank: 1/168	June 2019
<b>Wuhan University - School of Computer Science</b>	Wuhan, China
Bachelor of Engineering in Computer Science	June 2019

## SELECTED COURSEWORK

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**This Semester:** Convex Optimization, Deep Reinforcement Learning and Control

**Past:** Machine Learning, Interactive Data Science, Algorithms for NLP, Neural Networks for NLP, Cloud Computing, Computer Systems

## RESEARCH PROJECTS

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### Capstone Project – Auto-review: Opinion-aware Scientific Paper Summarization

Advisor: Prof. Alan Black Carnegie Mellon University | Fall 2020 (ongoing)

- Collected a dataset consists of ICLR papers and NIPS papers together with their aligned reviews.
- Annotated reviews in the dataset with aspect information using a sequence labeling model trained on partial human-labeled data.
- Investigated 2 paradigms for review generation: extract-then-generate and extract-then-generate-and-predict (generate a token and predict its aspect jointly).

### Aspect-based Abstractive Summarization Using Knowledge Graph

Team member, advisor: Dr. Pengfei Liu Carnegie Mellon University | Spring 2020

- Synthesized a dataset containing news articles with multiple aspects in each based on CNN/DM dataset.
- Investigated a sequence to sequence pretrained model BART's performance on the synthesized dataset.
- Designed a novel way to inject aspect information into BART: retrieve all neighbor entities of a given aspect word on knowledge graph, and give external reward when model generates those words.
- Outperformed vanilla BART by 0.7 ROUGE-1 score.

## COURSE PROJECTS

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### Cloud Computing – 15619 Carnegie Mellon University | Spring 2020

- Processed a large Wikipedia dataset using MapReduce programming model and analyzed topic trends.
- Designed a suitable policy to maintain the Quality of Service (QoS) of a web service and realized it through configuring and deploying Elastic Load Balancer and AutoScaling groups on AWS.
- Implemented strong and eventual consistency models for a distributed key-value store.
- Processed and analyzed a huge Twitter social graph with the PageRank algorithm using Spark.

### Algorithms for NLP – 11711 Carnegie Mellon University | Fall 2019

- Implemented a trigram language model using Kneser-Ney smoothing and achieved efficient storage using bit-packing trick to fully use the 64 bit size in a machine.
- Built an array-based CKY parser for English and improved its performance by doing complex structural annotation for the training data set.

- Implemented a word alignment model for English-French translation using Hidden Markov Chain and Expectation Maximization.

## **Introduction to Computer System – 15513**

Carnegie Mellon University | Summer 2019

- Implemented a cache simulator that simulates the behavior of a hardware cache memory.
- Designed a general purpose dynamic storage allocator for C programs with both high throughput and utilization.
- Developed a Linux shell program that supports job control and I/O redirection.
- Designed a proxy server which can deal with multiple concurrent connections with cache.

## **COMPETITION EXPERIENCE**

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### **Regression and Prediction Models: Climate's Impact on Fragility**, Interdisciplinary Contest in Modeling

Team member, advisor: Prof. Xinqi Hu

Wuhan University | Winter 2018

- Constructed 4 models based on study demands, including Polynomial Regression model, Wavelet Neural Network model, Analytic Hierarchy Process model, Probabilistic Risk Assessment model of flooding.
- Applied models into examples to identify the relationship between climate and fragility of a country, and evaluate interventions.
- Replaced Polynomial Regression model with Distributed Lag Nonlinear model based on robustness analysis, and conducted sensitivity analysis.
- Proved the models' value in predicting the trend of climate change, foretelling a country's fragility, thus helping government reduce potential loss.

### **The Parameter Calibration and Image Formation of Computed Tomography**, China Undergraduate Mathematical Contest in Modeling

Team member, advisor: Prof. Xuming Yi

Wuhan University | Fall 2017

- Concluded an equation based on some known parameters to explain the linear relation between penetration distance of the X-ray in templates and the absorption intensity tested by the corresponding detector.
- Collected the absorption intensity from 512 detectors at 180 angles, then, put all data into the equation to calculate the parameters with the least squares method.
- Utilized the estimated parameters to deduce the form and absorption intensity of unknown templates through the filtered back-projection (FBP) algorithm.
- Created a template to evaluate the accuracy and stability of the parameters obtained before.

## **HONORS & AWARDS**

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Jun. 2019	Outstanding graduate
Jan. 2018, Dec. 2016	Title of Merit Student
Nov. 2017, Nov. 2016	National Scholarship, Top 1%

## **SKILLS**

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**Application Software:** MATLAB, Photoshop

**Programming Languages:** C, Python, JAVA, Scala, Javascript, Bash

**Software and Frameworks:** Git, Maven, TensorFlow, PyTorch

**Operating Systems:** Linux, Windows, MacOS

**Languages:** English, Chinese (Native Speaker)