Howard Yen

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Education

Princeton University, Princeton, NJ May 2023
GPA: 3.980 out of 4.0, Departmental GPA: 4.0 out of 4.0
Intended in B.S.E. Computer Science, certificates in Robotics and Intelligent System and Statistics and Machine Learning
Coursework: Natural Language Processing, Advanced Computer Vision, Embodied Language Understanding, Operating Systems
Awards: 2nd Place at Citadel Terminal Live 2020, ICPC 2021 North America Finalists, Shapiro Prize for Academic Excellence 2021

Skills

Languages: Native in Chinese (Mandarin) and Fluent in English
Technical Skills: Advanced: Python, Java, C, C++, React JS, PostgreSQL; Proficient: OCaml, R, Figma

Work Experience

Software Engineering Intern, **Facebook AI Applied Research**, Menlo Park, California (Remote) May 2021 - August 2021

- Interned on the Privacy ML team at the Responsible AI org. Worked on researching and implementing sketching based gradient approximation and compression algorithm called FetchSGD in Python & PyTorch to optimize client-server communication in Federated Learning (FL) setup
- Achieved more than 80% gradient compression rate with less than 5% drop in performance on computer vision and natural language datasets like CIFAR10, CelebA, and Sent140 that are competitive with state-of-the-art FL training algorithms
- Worked closely with other engineers to refactored the code base and design new interfaces for the FL library to be more generic to accommodate new algorithms like FetchSGD

Grader, **Princeton University Computer Science Department**, Princeton, New Jersey February 2020 - May 2021

- Graded the coding assignments for the class COS 226: Algorithms and Data Structures, which has over 150 students per semester and 7 coding assignments in total, each consists of hundreds of lines of code and documentations
- Analyzed students' codes for their efficiency, style, and clarity, and provide feedback by teaching them good coding practices and more efficient implementations of algorithms and data structures like Binary Search, Union Find, and Dijkstra's

Machine Learning Intern, **Map My Customers**, New York, New York (Remote) June 2020 - August 2020

- Worked on the product team to analyze the data collected on mobile and web app, consisting of millions of rows of data
- Compiled and preprocessed data from the PostgresSQL database and developed PCA and SVM statistical models in Python with 89% accuracy to predict if users will buy a subscription based on their usage during free trial period
- Analyzed geopoints recorded by the mobile app to design a model that predicts a user's home/office locations and utilized the OpenStreetMaps API to obtain their addresses to help managers track sales representatives' activities

Projects

DensePhrases Representation Reader Models and Regularization February 2021 - Sept 2021

- Advised by Danqi Chen and Jinhyuk Lee. Worked on researching and implementing state-of-the-art neural reader model architectures in PyTorch to use on top of DensePhrases, a dense representation retriever model.
- Analyzed the effects of regularization techniques like dropout and weight decay on dense retriever models and mitigated overfitting problems by decreasing the differences between training and eval accuracy by 20% on datasets WQ and Trec

TigerResearch February 2021 - May 2021

- Designed an interface to browse research mentors and mentees and match them together for Princeton's Office of Undergraduate Research in Figma by collaborating with administrators and teammates and interviewing users.
- Developed frontend in React JS and backend in Flask to handle real-time searching and automatic matching features.

Leadership and Extracurriculars

Vice Chair, **Association for Computing Machinery**, Princeton University September 2019 - Present

- Host the annual Princeton Computer Science Contest by working out logistics, contacting sponsors, and writing problems
- Practice problem solving skills and algorithm and data structure optimization through competitions like ICPC

Design and Development Team Member, **RESearch INnovation DEsign**, Princeton University September 2020 - Present

- Conduct user interviews on the course selection process for college students to find ways to improve students' course selection experiences and develop a web app that integrates calendar and course reviews in Python and React

Princeton NLP Group, Badminton Club, Swimming, Fencing Club, Club Climbing