BAILE (PETER) CHEN

cbaile@seas.upenn.edu | (215) 252-6412 | peterbaile.github.io

EDUCATION

University of Pennsylvania, School of Engineering & Applied Science (Cumulative GPA: 3.87/4.00) Sep 2018 - May 2022

- Bachelor of Science in Engineering in Networked & Social Systems Engineering (NETS)
- Relevant Coursework: Database and Information Systems, Big Data Analytics, Internet and Web Systems, Scalable Cloud Computing, Machine Learning

PUBLICATIONS

- *Searching data lakes for nested and joined data. Yi Zhang,* ***Peter Baile Chen****, Zachary Ives. Under submission, 2021.*
- *Fault-tolerant and transactional stateful serverless workflows. Haoran Zhang, Adney Cardoza,* ***Peter Baile Chen****, Sebastian Angel, Vincent Liu, OSDI 2020.*

RESEARCH EXPERIENCE

Research Assistant, Incremental Inference project, University of Pennsylvania Database Group Jun 2021 - Present

Inferencing is a common inefficiency of ML models. When changes occur to training data, the model is retrained and weights are updated, leading to recomputation of inference results. To tackle the prolonged reinferencing time upon retraining, we are building a system that incrementally recomputes inference results. We investigated various ML models of entity matching (e.g. basic deep learning model, deep learning model with BERT/ LSTM) and aim to achieve incremental maintenance of knowledge graphs and associated query results.

- *Independent project*; advised by Professor Zack Ives (Department Chair of Computer Science)
- Devised the algorithm that uses existing inference results as threshold for subsequent inference results
- Combined the uses of threshold and heap sorting algorithms to achieve pruning
- Adapted techniques from relational databases such as incremental view maintenance to graph databases

Research Assistant, Juneau project, University of Pennsylvania Database Group (github.com/juneau-project) Jun 2020 - Present

We built a data management system for machine learning and data science projects to help data scientists readily create their own pipelines via reusing existing solutions and data from Kaggle/Github. We modeled it as a data lake search problem and proposed a richer set of capabilities for indexing and searching data products. With much improved scalability, the latest version of Juneau supports searching hierarchical and joined data as well as detecting composite data profiles.

- Collaborated with PhD students; advised by Professor Zack Ives (Department Chair of Computer Science)
- Developed the recursive parsing algorithm that normalizes hierarchical data into base relational tables
- Initiated the use of sketching techniques to speed up the process of creating and matching data profiles
- Enhanced scalability through pre-computations, incremental techniques, and in-database implementations

Research Assistant, Beldi system, University of Pennsylvania Distributed Systems Lab (github.com/eniac/Beldi) Jun 2019 - Aug 2020

To address the limited applicability of serverless computing to non-trivial end-to-end stateful applications, we built a library and runtime system for writing and composing fault-tolerant and transactional stateful serverless functions. We extended the existing log-based fault-tolerant approach with new data structures, transaction protocols, function invocations, and garbage collection.

- Collaborated with PhD students and Microsoft Research staff; advised by Professor Sebastian Angel and Vincent Liu
- Built the underlying AWS infrastructure and Python APIs for writing and composing stateful serverless functions
- Implemented variants of two-phase locking, two-phase commits, and lock with intent to enable fault tolerance and serializability of concurrent transactions

Research Assistant, Physics Department, The University of Hong Kong Aug 2016 - Dec 2016

- Examined the possibility of semiconductor-metal devices being the next-generation non-volatile memory devices
- Investigated the resistive switching behaviors of copper-doped zinc oxide using different metals as electrodes

PROFESSIONAL EXPERIENCE

Director of Tech Department, the Daily Pennsylvanian Jan 2020 - Feb 2021

- Revitalized the DP's digital infrastructure with the upgrade of website framework and introduction of ML techniques

- Pioneered the use of modern web frameworks (React, GatsbyJS, NextJS) to replace out-dated templating languages
- Transformed the Project Pages (*projects.thedp.com*) from basic HTML to GatsbyJS which renders faster and more interactive web pages
- Programmed and integrated content recommendation engine into the main site (*thedp.com*)

Team Lead & Full-Stack Web Developer, Penn Labs, University of Pennsylvania Feb 2019 - Dec 2020

- Utilized university authentication, dining and laundry APIs to build *Penn Basics (pennbasics.com)*
- Created the university's first food truck API, displaying operation hours, locations, menu, ratings, and reviews

Full-Stack Web Developer, Masterson Technology Limited Dec 2018 - Jan 2019

- Designed and built an online college application portal for startup *AppTrack Asia*

Backend Developer, Perfect World Co., Ltd Jul 2018 - Aug 2018

- Participated in the development and testing of MMO *LieHuoRuGe*

TEACHING EXPERIENCE

Instructor, CIS 197: Javascript, University of Pennsylvania Sep 2020 - Present

- Give weekly lectures to classes of 25 students, create assignments, and hold office hours
- Best-rated instructor of the course as of Spring 2021

Teaching Assistant, University of Pennsylvania Sep 2019 - Present

- CIS 555, Internet and Web Systems; CIS 320, Introduction to Algorithms (created the first course website *www.seas.upenn.edu/~cis320/* which has more than 500 page views per week); NETS 212, Scalable and Cloud Computing (mentored student teams in month-long final project to build simplified Facebook)
- Grade assignments, hold weekly office hours, and update course websites

AWARDS & ACHIEVEMENTS

- *Winner, Hult Prize@Penn 2019* Dec 2019
- *Winner, Penn Wharton Innovation Fund Implementation Award* Nov 2018
- *Meritorious Award, 3rd Annual International Mathematical Modeling Challenge* Jun 2017
- *Silver Medalist, International Sustainable World (Energy, Engineering and Environmental) Project Olympiad* May 2016