Xinya Yang

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EDUCATION

B.A. | Computer Science

Grinnell College | May 2020

- Major GPA: 3.81

COURSEWORK

Computation

Computation theory (ongoing)
Analysis of algorithms (ongoing)
Computer vision
Advanced operating systems
Computer organization & architecture
Algorithms & object-oriented design
Imperative problem solving
Data structures
Functional problem solving

Math

Graph theory
Linear algebra
Calc I & II

SKILLS

Programming Languages

C • C++ • JavaScript
MATLAB • Java • Bash • Scheme • Python
Go • Swift • Objective C

Frameworks & Models

Deep Learning
tensorflow • scikit-learn • Keras
Web Dev
D3.js • Node.js • HTML • CSS
Blockchain
Qtum

General

Software
ADOBE suite • tableau • stata • LaTeX
OS
linux • mac
IDEs
vscode • Emacs • intelliJ • Eclipse • Xcode

Languages

English • Chinese • German

Interests

Dance
Kpop Dance cover & performance
Modern dance composition & performance in social justice theme
Origami
Led a 120-min origami class combining lecture & hands-on activities

RESEARCH

Systems and Languages Research Lab | student researcher

June 2018 - Present

ALEX - a software profiler to improve physical resource efficiency through data analysis

- Spearheaded the development of data visualization part using d3.js
- Debugged and streamlined C++ code collecting performance data from the OS
- Designed and standardized the data format for the data analysis in Protocol Buffers
- Followed an Agile flow and acquired good version control

NEW project utilizing virtual page aliasing to optimize false sharing

WashU CSE Department | REU participant

Summer 2019

Understanding the use of blockchain in IoT (Raspberry Pi) from a system perspective

- Conducted a literature review on the use of blockchain in IoT
- Deployed several commercial blockchains to Raspberry Pis and set up private chains
- Implemented blockchain prototypes (PoW PoS) w/ Go as a future benchmark usage
- Developed a GUI for the inspection of different consensuses using PyQT5

CLASS PROJECT

Queue Size Determination </> | computer vision

A pipeline to calculate the size of a queue in videos using deep learning techniques and heuristics

- Implemented and trained a customized YOLO model w/ Coco dataset using Keras to detect and localize human in video frames
- Designed a lightweight yet effective algorithm for "in queue or not" determination
- Experimented the above two parts w/ different hyper-parameter systematically for analysis

No Use after Free </> | advanced operating systems

A customized allocator using Heaplayer to prevent all use-after-free and double-free errors in C/C++, which are currently the top root causes of CVE

- Utilized virtual page aliasing and MMU to invalidate freed objects
- Covered corner cases including large objects, interior pointers, parallel programs
- Very low time overhead in the evaluation process (7/10 benchmarks have <1% overhead)

Lead Concentration in Drinking Water | environmental chemistry

Part of the largest investigation into drinking water lead levels in the local area

- Wrote scientific instructions of sampling and collected 44 water samples in total
- Ran through ICP-MS to measure the lead and iron concentration
- Drew conclusion based on data visualization and stats method, such as ANOVA

NEW project developing a web-based data visualization for water management practice research

TEACHING & EXTRACURRICULAR

Intro CS Classes & Liberal Arts in Prison | mentor, tutor & grader

Fall 2017 - Present

- Grade homework and labs, hold review sessions once per week, and write worksheets
- Create and maintain the webpage of extra resources for students
- Emphasize the use of diagram and high-level planning and offer learning strategies
- Lead 1:1 math courses for students in prison w/o concrete math foundation

Grinnell AppDev iOS Team | developer & group coordinator

Fall 2018 - Present

We develop mobile applications for students, including a handy college directory for search

- Update user interface regularly under Apple guidelines for better user experience
- Coordinate team members for one project and hold weekly meetings