INTRODUCTION TO CLOUD COMPUTING COURSE PROJECT

TECHNICAL REPORT

West Chester University of Pennsylvania

February 2022

Prepared by

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Kieran Petrosky

Nassirdine Djibo

Personal information:

Email address: Nassourdine.djibo@gmail.com
GitHub: https://github.com/Nassirdine

Education:

Community College of Philadelphia: Associate in Applied Science 2017-2019
West Chester University of Pennsylvania: major: computer science B.S 2020- Now

Skills:

Java
Python
Microsoft

Speak: French, Arabic and English.

Experience:

Worked at Amazon a stower in 2016
Uber and Lyft driver for 5 years

Emma I. Loch emmailoch@gmail.com

560 Gralan Drive | Lancaster | PA | 17601 | tel: 717.471.3850

EDUCATION: WEST CHESTER UNIVERSITY, College of Science and Technology, West Chester, PA

Bachelor of Science, Graduation: May 2023
Major: Computer Science, concentration in Cyber Security (certification awarded)
Minor: Digital Marketing
Cum. GPA: 3.401, cum laude
| Honor's College Scholarship, Fall 2019 – Spring 2023 |
Selected Courses:

Computer Security & Ethics	Data Structures & Algorithms
Foundations of Computer Science	Computer Systems
Computer Science I, II & III	
Spring 2022:	
Introduction to Cloud Computing	Modern Malware Analysis
Programming Lang. Concepts & Paradigms	

ACTIVITIES & AWARDS:

Honors Student Association (HSA), member – (Fall 2019 - Present)
HAS Choir, member – (Fall 2019 – Present)
Computer Science Club, member – (Spring 2021 - Present)
Irish Dance Club, member – (Fall 2019 - Present)

WORK EXPERIENCE:

West Chester University, West Chester, PA January 2022 – May 2022
Research Scholars Program under the direction of Dr. Linh B Ngo MS, PH.D.

- Analyze subreddit communities to elucidate current issues confronting computer programmers along with potential solutions
- Refine research skills and coding skills

West Chester University, West Chester, PA Academic year 2021-2022
West Chester University Resident Assistant

- Enforce university rules and regulations
- Counsel students, residents, and fellow resident assistants
- Assist students in the dorm

Sheetz, Lancaster, PA June 2019 – June 2021
Team Member, Kitchen and Register

- Completed kitchen tasks and prepared food
- Interacted with and assisted customers

SKILLS & LANGUAGES:

- Java
- C
- Python
- Microsoft Word
- Microsoft Excel
- Microsoft PowerPoint

References available upon request U.S. citizen (*yes*)

Joseph McDowell

About me:
Email: josephrmcdowell@gmail.com | Phone Number: 215-435-7065
Websites: LinkedIn | GitHub | Awards: Eagle Scout
Goal:
Seeking a position in the field of Computer Science where I can utilize my skills to further work towards personal and professional development and contribute towards the prosperity of the organization.

Skills:

Self-starter | Self-regular | Critical thinking | Problem solving | Leader | Reading Documentation | Strong Communicator | Time Management | Positive Attitude | Forward thinking | Learning new tools | Python | C/C# | Java | Spark | Git | New languages

Education:

West Chester University of Pennsylvania | 2018 to 2022

Major: Computer Science B.S. | GPA: 3.7 | Organizations: Sigma Chi

Key Courses:

Data Structures | Algorithms | Big Data | Computer Security | Software Engineering | Cloud Computing | Artificial Intelligence | Modern Malware Analysis | Network Administration

Work Experience:

Employer: Kulicke & Soffa

Positions: Software Engineer Intern | Employment during Summer 2021

Description:

- Created automatic testing utilizing the Robot Framework to ensure consistency between release updates.
- Managed communication for the team assigned to the project via running meetings and gathering important information from other employees.

Projects:

Bee Careful

- A video game developed in Unity 3D game engine, programmed in C#
- I utilized git for version control and managed tasks using agile methods and Jira software.

Kieran Petrosky
8 Endslow Lane, Perkasie, PA18944
KP933775@wcupa.edu
267-424-0402

EDUCATION

- **West Chester University of Pennsylvania, College of Science and Mathematics**
    - West Chester Honors College, Class XXI
    - Major: Computer Science B.S.
    - Minor: Civic and Professional Leadership
    - Cumulative GPA: 3.733 *magna cum laude*
        - § Dean's List for the College of Science and Mathematics
    - Intended Graduation: Fall 2022
- **Related Courses**
    - Fall 2019 – Spring 2020: Computer Science I, Computer Science II
    - Fall 2020 – Spring 2021: Computer Science III, Foundations of CSC, Computer Security & Ethics, Computer Systems, Data Structures & Algorithms
    - Fall 2021 – Spring 2022: Software Engineering, Programming Language Concepts & Paradigms, Data Communications & Networking, Intro to Cloud Computing, Modern Malware Analysis, Computer Security

ACTIVITIES

- **Honors Student Association (HSA)**
    - Fall 2019 - Present
    - University-associated organization dedicated to providing volunteerism and service within the local community.
- **West Chester University Incomparable Golden Rams Marching Band**
    - Fall 2019 – Fall 2021
    - Performs in exhibition at football games, local competitions, and regional and national events
    - Recipient of the 2019 Sudler Trophy, awarded to the college marching band which demonstrates the highest musical standards in the nation.

EXPERIENCE

- **Research Scholar's Program (West Chester University of Pennsylvania)**
    - Spring 2022, under the direction of Dr. Linh B Ngo

- Analyze subreddit communities to elucidate current issues confronting computer programmers along with potential solutions

SKILLS

- **Programming Languages**
  - Java, C, Python, OCaml
- **Operating Systems**
  - Windows, Linux

Evan Older

Email: evanmolder@gmail.com
Mobile: 267-280-3365
Github: https://github.com/eolder
LinkedIn: https://www.linkedin.com/in/evan-older-1646721a1/

Education

West Chester University of Pennsylvania

- B.Sc. in Computer Science with a minor in Physics - December 2022
- M.Sc. in Computer Science - December 2023

Work Experience

Software Engineer, Intern - Rajant Corporation - June 2020 to Present

- BCCLI - Implemented/Designed a command line interface management application for Rajant Breadcrumbs™, in **Go/Rust**.
- Maintained and built **Linux** firmware for Rajant Breadcrumbs™.
- Automated aspects of development pipelines using **Bash**.

Rajant Corporation, 200 Chesterfield Pkwy, Malvern, PA 19355, (484) 595-0233

Front End Associate - Giant Food Stores - Summer 2017 to Spring 2020

- Maintained a safe and clean store environment, while keeping guests satisfied with their shopping experience.

Giant Food Stores, 1824 Ridge Pike, Royersford, PA 19468, (610) 831-5450

Skills and Knowledge

Languages:

Rust, **Go**, **Java**, **C**, Python, NodeJS, **Bash**, Ocaml

Software:

CAD, **Linux**, **OpenCV**, VMware ESXi, Proxmox Virtualization Environment, **Google Protocol Buffers**, Verilog/SystemVerilog, NGINX/Apache reverse proxy, Google Cloud APIs, Amazon Web Services Elastic Compute, OpenVPN, OpenCA.

Hardware:

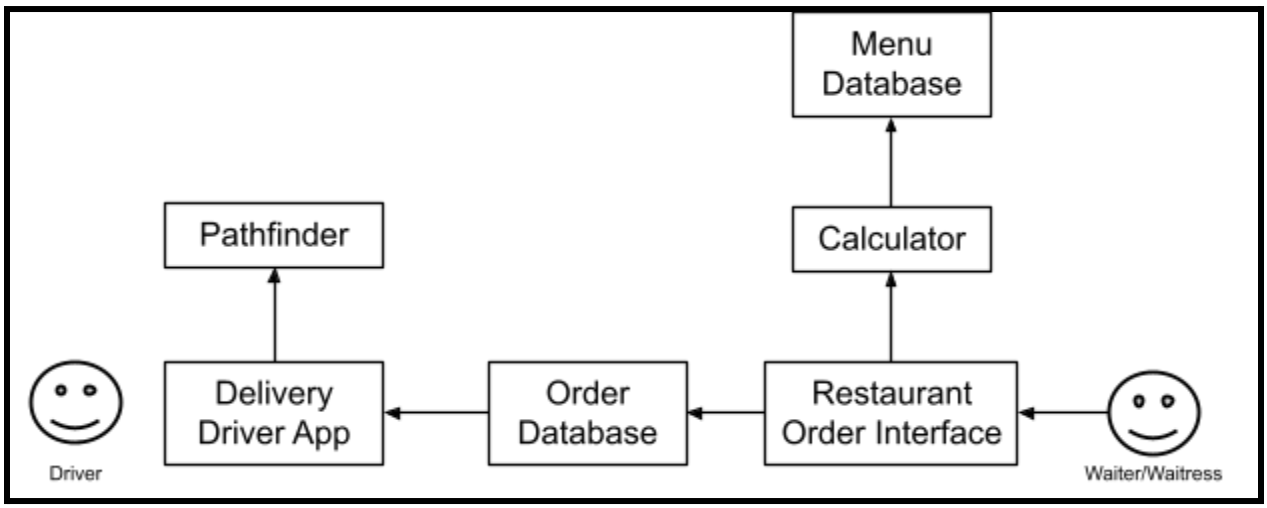
3D FDM Printers, Espressif Microcontrollers, Arduinos, Particle MCUs, Rack Mount Server Maintenance.

Noteworthy Personal Projects

- Full-Stack Over the Air firmware management platform for Espressif Microcontrollers, written in **Rust**, **Bash**, and **C++**.
- Computer Vision tracking platform/gimbal, using **Java** and **OpenCV**.
- Custom RESTful API/solution for managing lighting/fans, using **C++** and **Java**.
- (WIP) CAN/OBDII Development Board, based on the Espressif ESP32 SOC.
- Custom Antenna design - Quadrifilar Helix Antenna tuned to 127MHz, to capture NOAA satellite signals.
- Custom rack mount **Linux** server, for hosting various projects including bullet #1.

CHAPTER 1
Team Vision and Design

Our team's vision is to create a cloud-based service for restaurant ordering and delivery. The service will provide cashiers an order GUI to input orders. The system will calculate the prices through accessing a menu database, then post the orders into an order database, organized depending on the type of order. From there, we intend to have a delivery driver application or other interface which delivery drivers can select which delivery orders to take. The service will pathfind the most optimal route to take to deliver food faster and more reliably.



Frontend components
- Restaurant Order Interface, Delivery Driver Application

Backend components
- Calculator, Pathfinder

Databases
- Menu Database, Order Database

How the system will function:
- Waiter/waitress inputs order into restaurant order interface
- Calculator gets menu prices from menu database, calculates order price, and passes price to restaurant order interface.
- Restaurant order interface posts order data into order database
- Delivery driver application gets available delivery orders from order database for delivery driver to select
- Deliver driver application passes selected order information to pathfinder, which calculates and returns optimal driving route for delivery driver

CHAPTER 2
Addressing Technical Requirements

In order to address and meet the technical requirements of the project, we will first finalize the concept of each component of the service. This includes finalizing each action all frontend and backend components will take, and all the detailed information that each database will contain.

After finalizing the service conceptually, we will look into implementing each component of the service. We will decide what programming languages and database structures will be utilized to create all aspects of our services. We will also install all software and tools needed to successfully construct our cloud-based restaurant services.

Team members will then work together to configure a restaurant order interface and a driver interface where users may interact with the application on the front end. Separately, our team will construct backend components and create our databases as shown in the project design. We will also successfully implement CI/CD services in our ordering and delivery system.

After producing working software, the application will successfully run within a single CloudLab profile and instantiate/collect results of at least 20 runs. The service will be able to automatically process customer orders and store them in the order database. The delivery driver application will automatically update with new delivery orders, and will provide an optimized route to drivers orders based on time of order and location. The service will demonstrate a high level of system complexity and effectively utilize cloud services.