Prior Experience

During my undergraduate studies in Electronics and Telecommunication, I was fortunate to have undergone a multidisciplinary curriculum consisting of algorithms, data structures, operating systems, databases, and machine learning courses. I also completed several course projects like a tour booking application using JavaScript and MongoDB, a web app that provides market sentiment by performing natural language processing on Bitcoin-related tweets using Python, a platform to make transactions on Ethereum blockchain using Solidity and designing a real-time operating system on ARM Cortex-M. These projects developed an early interest in pursuing software engineering as a career.

I worked on two major research projects in the third year of my undergraduate studies. The first project, aimed to assist visually impaired people while crossing intersections by detecting and classifying crosswalk signals. I compiled a comprehensive dataset by capturing images of pedestrian signals under diverse lighting and weather conditions. For feature extraction, I utilized SIFT and enhanced the computational efficiency through PCA. After training various classifiers Random Forest achieved the highest accuracy of 86%. The second project, aimed to assist lower-limb amputees by classifying movements with EEG signals. I recorded EEG data of volunteers with appropriate audio-video cues, using a 24-channel EEG machine with electrodes placed in the motor cortex regions. The recorded EEG data was then preprocessed to isolate frequency bands, and statistical features were extracted to train classifiers for motor action recognition. These projects provided hands-on experience in researching, designing, and executing end-to-end AI systems, including data collection, preprocessing, feature extraction, and model evaluation.

In my final year, while interning at Relatient, I was assigned to redesign and optimize an important process of Relatient's product ecosystem which is responsible for finding early appointment slots for waitlisted patients. Initially, this process consisted of three large PostgreSQL stored procedures which would take up hours to execute and frequently would get stuck under heavy load and thus be unable to find appointments for patients. I converted these stored procedures into clean and maintainable Java code separating the core business logic from the database. To enhance the overall speed, I implemented multithreading, to process multiple patients concurrently. Patients seeking an early appointment slot for the same healthcare provider caused an unbalanced assignment problem which I solved using the *Hungarian Algorithm* to ensure optimal pairing of patients with the contesting appointment slots. I wrote unit tests with 100% code coverage with test data which ensured all edge cases were covered and also conducted integration testing of the entire process. This improvement led to a major decrease in the overall execution time and eliminated process hang-ups, creating over 25,000 early appointments each year across the US and got me a full-time offer.

After my conversion at Relatient, I contributed to the development of Dash Direct, a healthcare API platform. Over the past one and half years, I have played multiple roles such as a backend developer, a DevOps engineer, a software tester, and even a solution architect in the successful rollout of the project. I began by conducting proof-of-concept work to introduce event-driven architecture and serverless

technologies to the system and did the initial setup of multiple AWS services. One of my most challenging and rewarding contributions to Dash Direct was developing a patient search API by integrating NextGate, an Enterprise Master Patient Index (EMPI). I designed a custom patient-matching logic, presented the workflow to Relatient Executives, NextGate experts, and client Solution Architects, and secured approval before implementation. The API enables fine-grained control to search patients in EMPI, Relatient's database, or Electronic Health Records (EHRs) while allowing users to adjust the accuracy of matching logic. Built with scalable design patterns, the API also supports seamless integration of additional EMPI systems. Additionally, I conducted stress testing on the suite of 25+ APIs to optimize performance ahead of production deployment. By introducing Redis-based caching, refactoring Lambda function code, and fine-tuning its infrastructure I achieved a 90% reduction in its execution time which significantly improved the overall API response time. Today, Dash Direct powers appointment scheduling systems for major clients, including Ascension, across multiple locations in the US.

Career Goals

In the past 1.5 years at Relatient, I have gained hands-on experience across every IT Project Management Lifecycle stage, from resource gathering to training support teams and overseeing production monitoring. This has sparked a strong interest in me to pursue a future in Project Management. I believe that by combining technical skills with project management knowledge, I'll be able to make a larger impact. After completing graduate school, my goal is to continue working as a software engineer, blending both technical expertise and project management skills. In the long term, I aspire to take on project management roles, where I can oversee and lead teams, manage larger projects, and drive impactful business outcomes. A Master's in Information Systems Management (MISM) degree will provide me with the technical and business skills required for senior roles in IT thus making me a well-rounded candidate for positions like VP or CTO in the future.

After completing graduate school, I am biased towards joining companies in the healthcare technology industry, given my prior experience and familiarity with the sector. However, I am open to new opportunities in other industries like banking, finance, and technology.

Why Heinz College?

The interdisciplinary nature of the MISM program at Heinz College is the ideal fit for my goal of combining technical knowledge with leadership skills to advance into managerial roles. The program's comprehensive curriculum, with courses such as Healthcare Information Systems, IT Project Management, Machine Learning for Problem Solving, Distributed Systems for Information Systems Management, Database Management, and Cloud Security aligns perfectly with my goals and interests. Additionally, I am excited to explore courses like Blockchain Fundamentals, Network and Internet Security, and Optimization and Risk Modeling for Managers, which are new to me and will further expand my technical knowledge.

At CMU, I am eager to collaborate with world-class faculty and researchers such as Dr. George H. Chen, Dr. Rema Padman, Dr. Holly Wiberg, and many other distinguished faculty whose work in healthcare technology closely aligns with my prior experience in optimizing healthcare systems. Their expertise will be invaluable in helping me deepen my understanding of the subject.

I am also excited to join and learn from the AWS Cloud Club, where I can further expand my knowledge in AWS by engaging in real-world business-related projects. I also look forward to sharing my hands-on experience with AWS services, particularly optimizing AWS Lambda functions.

Furthermore, I have received nothing but positive feedback from my undergraduate alumni who pursued MISM at Heinz and are now thriving in companies like Google, Amazon, and BNY. I am confident that my time here will allow me to follow a similar path of success. The unique combination of technical and management focus at Heinz College makes it the perfect place for me to achieve my long-term career goals.