

Enhanced Smart Home Management System

Tyler Hine
Zachary Holecz
Chrisma Ndlovu
Sean Welby

Introduction

We are excited to announce the upcoming Smart Home Management System (SHMS), a platform that will transform user engagement with home environments. This technical preview is designed to give you a glimpse into the future of home automation, emphasizing safety, energy efficiency, and simplicity. Our goal is to make the SHMS intuitive for everyone, regardless of technical background.

System Description

The SHMS will be a comprehensive solution that provides real-time monitoring and control of smart home devices. It will also introduce an innovative scenario generation feature powered by the ChatGPT API, offering users a narrative of smart home responses to various situations.

How It Will Work

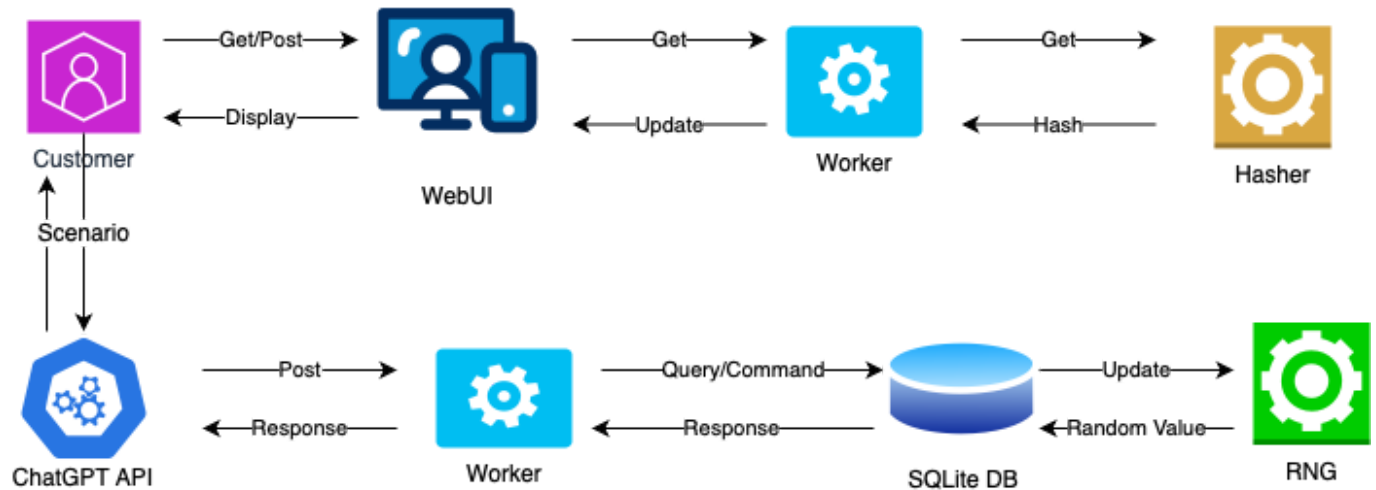
User Interaction

Users will be able to interact with the SHMS through a web-based interface, designed to offer control over smart devices and to request illustrative scenarios showcasing the system's capabilities.

System Components

- **WebUI:** The front-end portal for user interaction with the smart home environment.
- **Worker:** The back-end service that will process requests and issue commands to smart devices.
- **Hasher:** This security component will encrypt sensitive data to ensure privacy and protection.
- **RNG:** A random number generator that will provide additional security layers for operations requiring randomness.

- SQLite DB: The database that will store device states and user configurations.
- ChatGPT API: The AI-powered service that will generate descriptive scenarios for user education and engagement.



Anticipated Features and Benefits

- **Emergency Response:** The SHMS will detect emergencies, such as gas leaks, and will respond by executing safety protocols like gas supply shut off and alerting emergency services.
- **Energy Optimization:** The system will analyze energy consumption patterns to suggest efficient usage, aiming to conserve energy and reduce costs.
- **User-Friendly Interface:** The SHMS will feature an easy-to-navigate web interface, simplifying smart home management for users.
- **Interactive Scenarios:** Utilizing the ChatGPT API, SHMS will generate scenarios educating users about the system's functionality and event responses.

Value Proposition for Future Stakeholders

For the technical community, the SHMS promises a modular, scalable, and secure architecture that integrates cutting-edge technologies into a seamless user experience, powered by AI.

For our non-technical audience, SHMS will act as your home's guardian angel - watching over you, ensuring your comfort, and managing your home's efficiency, all while educating you about the wonders of smart technology.

Conclusion

The Smart Home Management System is not just a concept; it will be a vital step toward a future where homes actively contribute to safety and sustainability. It will cater to tech enthusiasts and everyday users alike, embodying the next evolution of home living.

Zachary Holecz - Resume

Computer Science Major seeking to obtain a challenging seasonal full-time internship.

PROJECTS:

- Python Object Creation: Created a simulated library organization system
- Designed, Specified, Procured, & Assembled my own Personal Computer
- Front-End development of web-based applications

SKILLS:

Proficient with Java, Python, Basic C, Haskell, HTML, Java Script coding languages
Proficient with Microsoft Office Applications
Mathematical Skills: Problem-solving, Calculus, Statistics

EDUCATION:

West Chester University, B.S. Computer Science - (2021- present)

CumGPA 3.63 - College of Sciences & Mathematics, Computer Science Department
Courses: Statistics 1, Technical Writing, Computer Systems, Computer Science I, II, and III

George Mason University, B.S. Computer Science - (2019 - 2021)

GPA 2.9 - *Volgenau School of Engineering*, Department of *Computer Science*
Courses: Introduction to Computer Science, Introduction to Python, Calculus 1

Owen J Roberts High School, Academic Honors Curriculum (2016 - 2019)

GPA 3.6 (2019), Honor Roll (2016-2019)

Courses: AP Computer Science (2019), honors English, Honors Sciences, and Honors Mathematics (2016-2019)

HONORS/AWARDS:

George Mason University - Mason Freedom Scholarship, Mason Impact Award (2019 - 2020)

Owen J Roberts HS Academics - Barry Irwin Memorial Scholarship for Computer Science (2019)

Owen J Roberts HS Robotics - State Tournament Qualifier, Team Co-Captain, (2019)

Owen J Roberts HS Orchestra - Menchy Music Award (2019), Violin (2012 - 2019)

ACTIVITIES:

West Chester Rugby Club - National Finalist Team 2021

George Mason University Rugby Football Club - Varsity Team Starter (2019)

Coventry Wildcats Rugby Football Club - Co-Captain (2019), Undefeated Season (2019), HS State Finalist Team (2019), U15 - 3rd Place State Championships (2016), Team Member (2013 - 2019)

WORK EXPERIENCE:

Enterprise - Seasonal Automotive Detailer (Summer 2021 & Summer 2022):

- Worked as an automotive detailer at the Pottstown location
- Cleaned and sanitized vehicles
- Transported vehicles to other Enterprise locations
- Pick up customers and take them to the location

Sean Welby - Resume

Well-grounded and solution-oriented Computer Scientist with a wide variety of programming experience. Experienced in C, HTML, Python and particularly skilled in Java and Linux. Works well on team-based projects, motivating myself and others to be productive. Seeking to use my backend and security experience in an entry level position.

EDUCATION

West Chester University, West Chester, Pennsylvania

Bachelor of Science: Computer Science
2024

Expected May

Computer Security Certificate
2024

Expected May

CompTIA Security+
March 2024

Expected

Relevant Courses: CSC I/II/III, Computer Systems, Data Structures & Algorithms, Computer Security & Ethics I/II, Foundations of Computer Science, Data Com/Networking, Digital Image Processing, Software Security, Software Engineering, Modern Malware Analysis, Intro to Cloud Computing

COMPUTER SKILLS:

Programming Languages: Java, Python, C, SQL, Haskell, R

Operating Systems: Windows, Linux

Applications: MatLab, MS Office, GitHub, Oracle Virtual Box, Hack The Box, TryHackMe, Cisco Packet Tracer, VS Code, Wireshark

Security: Pen Testing, Decryption/Encryption, Firewalls, nmap

Activities/Clubs: Computer Science Club, Cyber Security Club, Judo Club,
Intramural Soccer

EMPLOYMENT

Turtle Back Zoo Employee, Essex County Parks Department: May 2020- Present

560 Northfield Avenue

West Orange, NJ 07052

Duties: Cashier, Chauffeur, Customer Service, Answering Phones, Crowd Control,
Carousel/Train Conductor, Paddle Boat Worker, Parking Director, Expo,
Party/Event assistant.

Summer Custodian, Florham Park School District: Summer 2018, Summer 2019

151 Briarwood Rd

Florham Park, NJ 07932

Duties: Custodial Assistant (cleaning, painting, landscaping, construction)

Tyler Hine

Hinetyler0@gmail.com - 484-680-1653

EDUCATION

West Chester University, West Chester, PA

Bachelor of Science in Computer Science, May 2024

RELEVANT COURSEWORK

Discrete Mathematics: Mathematical concepts used in computer science

Management of Information Systems: Data Communications and Networking

Computer Science: Software Engineering; Front-End Development, Back-End Development

Computer Science: File and Data Structures

WORK EXPERIENCE

Vecchia Pizzeria

Pizza Maker, May 2022 - Present

- Manage the inventory of ingredients for each week of business
- Prepare the dough for each week of business
- Shape, dress, and cook the food for customers' orders

Bella Napoli

Delivery driver, May 2018 - April 2022

- Delivered customer food and drink orders in a timely manner
- Managed the inventory of food storage for each week of business

- Collaborated with coworkers to keep the restaurant up to and above health standards
- Completed trips to Philadelphia to pick up weekly food inventory

Giant

Cashier, March 2016 - August 2016

- Handled the transaction process of customers that purchased groceries
- Maintained the organization of outdoor store property
- Generated weekly performance reports for peers

SKILLS

Proficient in Word, PowerPoint, Excel, Java, C, HTML, Angular, CSS, JavaScript

Chrisma Ndlovu

P: (267) 382-6879

E:chrismandlv@icloud.com

VB .NET | JavaScript | Data Modeling | SQL | Python | Analysis Skills | Information Security | Database Programming | Troubleshooting

Summary:

- Computer Science student pursuing software engineering seeking internship opportunity to gain hands-on experience. Offering creativity, critical thinking, and active listening. Highly organized, proactive, and punctual with strong motivation for success.
- Skilled and detail-oriented Computer science student with a keen interest in Software Development, Software engineering, Artificial intelligence, Mobile Application Development, and User Interface Designer
- Learned how to set up version control, bug reports, and continuous integration tools.
- Studied the Incorporated data collection for automated testing of IBM firmware using Python and SQL Developed internal web tools for data visualization and manipulation that became used across teams of 100+ developers, testers, and managers.
- Knowledge of Defined standards and constraints of projects using wireframes, feedback, and docs Worked with multiple MySQL databases.
- Wrote code, fix bugs, developed software using version control Website Management: Help maintain the website.
- Ability to Carry out Analysis, Requirement understanding, and feasibility, System designing, Implementation, and Testing.
- Ability to work with customers to understand project requirements and set up the development timeline.

Education:

Montgomery County Community College, Blue Bell PA

May 2022

- Associates of Applied Science in Computer Science

GPA: 3.2

Technical Skills:

- Programming Language: Java, HTML/CSS, C++, SQL, Python, JavaScript, swiftUI, Visual Basic, MIPS
- Programming Tools: Eclipse, PyCharm, Code Runner, JGrasp, Xcode
- Tools and Frameworks: Word, Access, Excel, PowerPoint, Visio
- Cloud & Databases: MySQL
- Graphic Design: Maya, Unity

- **Work Experience:** Proficient in Proxmox, Tenable, Qualys, Hyper-V, IT Support, Help Desk Management, Access Control Systems, Emergency Communication Systems.
- **Soft Skills:** Strong leadership, problem-solving, communication, project management, and team management skills.
- **Interpersonal Skills:** Strong Internet Research, Excellent Verbal, Written and Quantitative Skills, Time Management and Prioritization Abilities, Effective Presentation and Negotiation Skills
- **Others:** Honesty, Active Listening, Empathy, Collaboration, Multitasking
- **Interests:** Creative Writing, Arts and Culture, Traveling, Education, New Media, Advancing of Technology

Project Experience

College Project Team Project

Oct 2021 - Dec 2021

- Creating a website for a tourism company using HTML
- Utilizing Annotation-Based Configuration, design and build the different modules for user registration/login, products information editing, and cart items editing.
- Use of location-based ads and use hyperlinks to provide data for specific tourist attractions.

Building an SQL Database

Sept 2021 - Dec 2021

- Created a full database for a company selling Antiques.
- Created several queries using the SQL to display in Excel based on the information needed by the company

Data Management Internationale

June 2022 - June 2023

- Managed IT support and help desk operations, ensuring timely resolution of internal and customer technical issues.
- Led the installation and configuration of a Proxmox environment, transitioning from Hyper-V to enhance system efficiency and reliability.
- Implemented and configured Tenable and Qualys for comprehensive vulnerability scanning, significantly improving security posture.
- Spearheaded vulnerability remediation efforts, reducing potential security risks and ensuring compliance with industry best practices.
- Oversaw the addition and configuration of an access control system to manage employee access to restricted areas, enhancing security and compliance.

- Developed and implemented an emergency communication system, enabling rapid text messaging to workers in case of emergencies, thereby improving response times and safety protocols.

Accomplishments

- Dean's List in Montgomery County Community College
- Phi Theta Kappa Honor Society