

# Secure Sight Security System



**Trinity Ison**

University of Advancing Technology

**Robotics and Embedded Systems**

# Problem Statement

## **Context:**

Traditional peepholes and door cameras provide limited or inconvenient views of who is at the door. Smart doorbells and security systems offer improvements but still limit the view, reliant on cloud storage, or lack real-time visibility without using a phone.

## **Problem:**

Residents often struggle to get a clear, immediate, and secure view of visitors at their front door without opening it. Current solutions may be either analog (peepholes), low-tech (mirrors), or digital but require screen interactions or mobile devices. In scenarios involving elderly users, quick decisions, or low lighting, these limitations can pose risks.

## **Objective:**

To develop a Door Projection Security System that captures a live image or video feed from the outside of a door and projects it accurately to scale on the interior surface (like the opposite side of the door or wall), allowing the resident to see who is outside in real time, without using a mobile device.



# Innovation Claim

The Door Projection Security System modernizes the conventional peephole and smart displays by projecting a real-time, scaled image of visitors directly onto the interior of your door. This provides a safer, more intuitive, and hands-free method to identify who is outside—eliminating the need for a phone or smart displays .



# Technical Expertise & Skills

## **Computer Vision and Embedded Systems Engineering.**

This technology combines **real-time video processing**, **projection hardware**, and **intelligent sensing** to develop a cutting-edge, security solution designed for home use.

Innovative Camera Tools and Techniques DVA265, C/C++ Programming I CSC215, Software Engineering Principles, Embedded Programming RBT211, Product Development TCH200, Designing Human Computer Interfaces HCI215

- **OpenCV** – to process video input (image scaling, edge detection, motion tracking, etc.).
- **Linux / Raspberry Pi OS** – for configuring and deploying the system on an embedded device.
- **Raspberry Pi or Arduino programming** – to interface with the camera, sensors, and projector.
- **Circuit assembly** – connecting camera modules, projectors, and microcontrollers safely.
- **Power management** – ensuring the devices are powered correctly and safely.



# Project Description & Scope

The **Door Projection Security System** is a smart, real-time solution designed to enhance residential security by projecting a live video feed of visitors directly onto the inside surface of the door. Instead of relying on traditional peepholes, phone-based apps, or expensive smart doorbells, this system uses a front-facing camera and a short-throw projector to create a life-sized, to-scale display of anyone standing outside the door. The system is triggered automatically by motion or doorbell activation and provides a hands-free, intuitive, and privacy-focused alternative to existing solutions.



# Project Execution: How I'll Build the Door Projection Security System (Solo Developer)

This project aims to create a Door Projection Security System, a real-time security solution that captures video of someone standing outside a door and projects it onto the inside surface of the door at life size. The system will use a camera, short-throw projector, motion detection, and a Raspberry Pi, making home security more accessible, intuitive, and private—with no need for phones or smart devices.

# Target Market

The target market for my project includes individuals seeking a more secure, intuitive, and comprehensive view of the exterior of their home without the need for additional devices. This product would particularly appeal to seniors who have difficulty operating or viewing smart devices, as well as residents of metropolitan areas with higher crime rates, such as home invasions. It allows homeowners to see who is on the other side of the door before even approaching it.



# Prior Art

List similar products and services by name followed by URL link

**Ring** <https://ring.com/collections/video-doorbell-cameras>

**Google Nest Doorbell** [Nest Doorbell \(wired, battery\) - Google Store](#)

**Arlo** [Arlo Security Cameras System & Video Doorbells | Up to 25% Off](#)



# Prior Art

The Feather River Doors Smart Glass 3/4-Lite Smooth Unfinished Fiberglass Prehung Front Door is a modern, customizable entryway solution featuring Switch™ Smart Glass technology. This allows users to toggle the glass from transparent to private instantly via a button or the Hubspace™ app. The door requires no hard wiring and comes equipped with batteries, a control box, a battery charger, and charging cables. It also features a durable woodgrain PVC jamb and ball-bearing hinges for optimal performance.

Feather River Doors. (2025). \*Smart Glass 36 in. W. x 80 in. Right Hand Inswing 3/4-Lite Smooth Unfinished Fiberglass Prehung Front Door\*. The Home Depot. Retrieved May 18, 2025, from <https://www.homedepot.com/p/Feather>



# Proof of Concept/Early-Stage Prototype



Outside looking  
into home



Inside looking  
outside door closed



Inside looking  
outside door open



# Q&A

Trinity Ison, Robotics and Embedded Systems

**The residential door system that converts the inner surface of the door into a dynamic, real-time projection screen, showcasing the outside view from an integrated doorbell camera.** This system improves security, awareness, and convenience by allowing residents to view life-sized video projections of visitors, akin to peering through a transparent door, while maintaining the door's structural strength and privacy.

