

## Preliminary Project Description

**Team Name:** Home Security

**List of team members (5 maximum):** Amaris Vanegas, Adeniyi Emiabata, Thomas Silva Gonzaga, Lucas Carrit Delgado Pinheiro, and Ana Rivera

### **Brief Project Description:**

According to the NFPA, 358,000 homes in the United States experience structural fires yearly. Further, more than 7 million property crimes were committed in 2020, with burglary being the second most common crime in the country. In addition, 32% of households in the US are fueled by natural gas, and leaks can be extremely hazardous to all living on the property. These and many other dangers can be mitigated by having an efficient home security system (HSS). HSSs make households safer and give homeowners peace of mind when absent.

However, these systems can be costly and are almost three times more present in households with incomes above \$100K than among lower-income homeowners, making them easier targets for break-ins and other crimes. In addition, less privileged families are often more likely not to have the necessary safety resources to prevent gas leaks and fires. Our ESP32-based home security system will be inexpensive and offer contact, motion, smoke, flame, and vibration sensors to insulate the house from the most varied dangers. In this way, we propose a product that ensures homeowners a safer and more secure life while being financially accessible to most people.

### **Features demonstrate on Demo Day:**

1. Door alarm that activates when any door leading to the exterior of the house is opened or closed
2. Motion sensors detecting motion in front of the door.
3. Separate alarm that is activated when the motion sensor detects a distance closer to a predetermined limit. The distance must be below the limit for at least five readings in a row to avoid any issues with bad readings.
4. Website which sensors connect to and update homeowners on what is happening to their house.
5. Feature on the website that allows the user to check the current distance of the closest object to the door and access a history with all the times when there was a security break due to proximity to the house or to doors being opened.

### **Technology Analysis:**

List any key technologies and show that they are available, affordable, and accessible. By accessible, I want you to show that you can reasonably incorporate the technology into your design.

- Contact Sensor : [Magnetic \(Reed/Switch\) Door Sensor](#)
  - Digikey Part Number: 59140-010-ND
  - Price: \$3.44
  - Quantity in stock: 5,921

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- Motion Sensor: [Mini PIR motion sensor \(AM312\)](#)
  - Adafruit Product ID: 5578
  - Price: (If 1-9 are purchased) \$1.95
  - Quantity in stock: 100's
- Gas/Smoke Sensor: [MQ6 Gas/Smoke Sensor](#)
  - Digikey Part Number: 1597-1297-ND
  - Price: \$7.60
  - Quantity in stock: 222