

# SMART ARDUINO HELMET



**MAKERERE UNIVERSITY**  
DEPARTMENT Of COMPUTER SCIENCE

GROUP 19

- Weredwong.J.Precious - Ayebare Atuhaire Eunice - Tusiime Mark - Okure Enock - Namuyimbwa Martha

## 01 Problem

Uganda experiences a high number of boda boda-related accidents, particularly in cities like Kampala. Many of these accidents go unnoticed, and victims are often unable to call for help due to unconsciousness or injury. This leads to delayed medical response and preventable fatalities.

## 02 Project Objectives

- Develop a smart helmet that detects crashes
- Enable automatic emergency SMS alerts with location sharing
- Provide a manual panic button for quick help requests or false alarm cancellation
- Ensure safety and usability without altering helmet structure

## 03 Project Requirements

- Arduino UNO R3
- Breadboard
- SIM 800L module
- MPU 6050 module
- Jumper wires
- Battery
- Push button
- Charging & Boost Converter Module

## 04 Target Users

Boda boda & delivery riders

Emergency Responders

NGOs & road safety campaigns

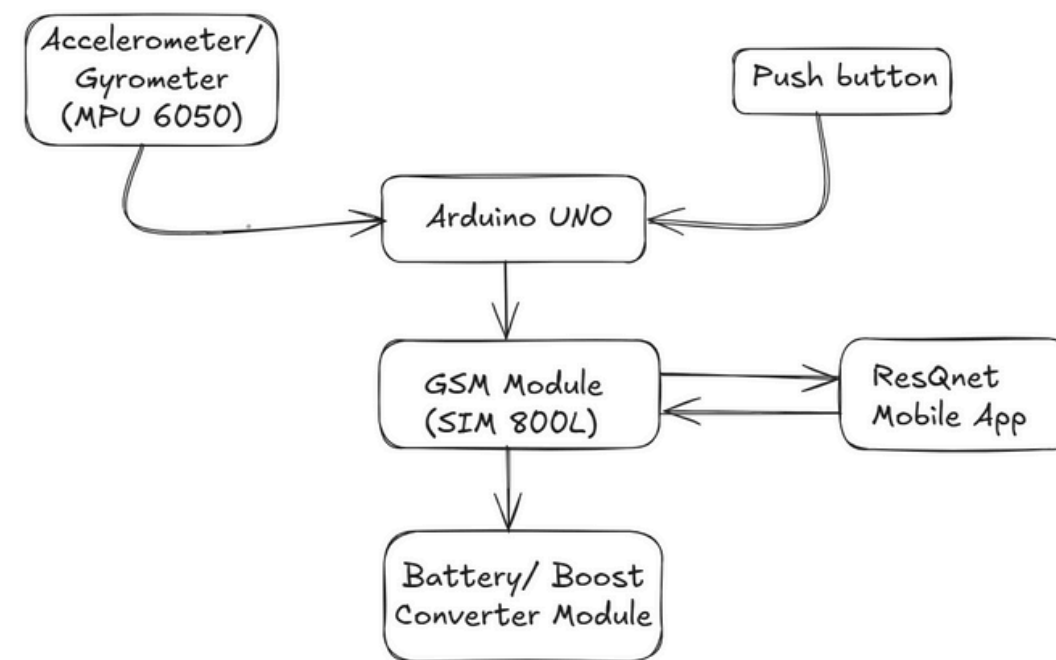
To ensure safety, emergency assistance, and compliance with regulations

To receive & respond to emergency alerts faster

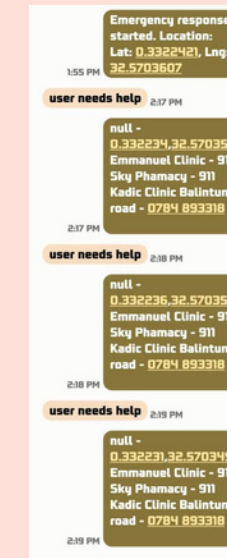
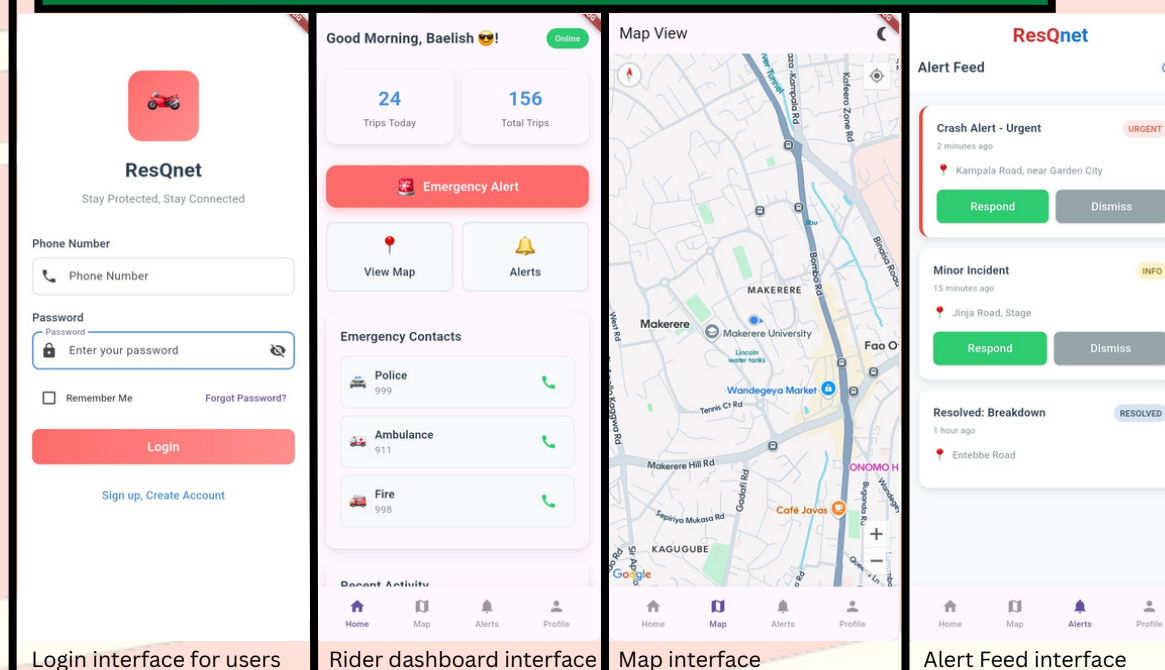
To promote helmet use to reduce fatalities

## 05 Project Design

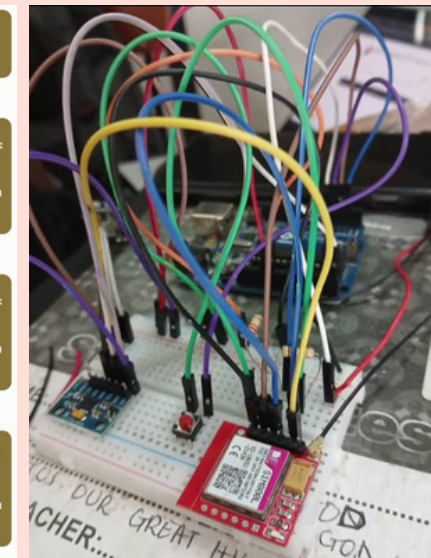
Smart Arduino Helmet Accident Detection and Emergency Alert System:



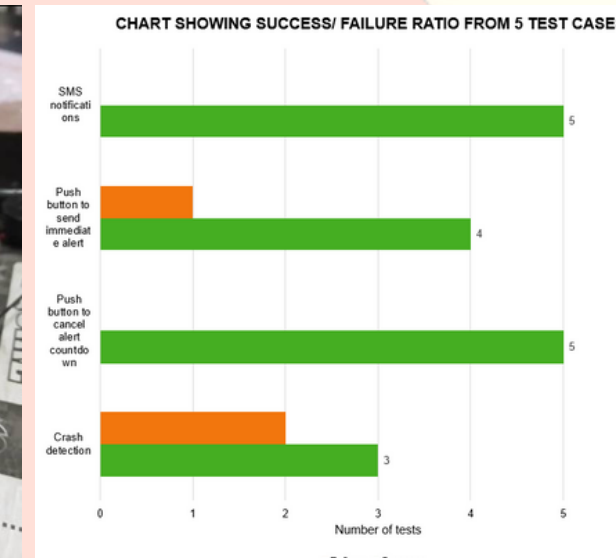
## 06 Results



SMS from app with nearby hospital details



Hardware Setup



Test results graph

## 07 Future work

- Improve GPS accuracy with dedicated module
- Add Bluetooth to sync with rider's phone for real-time tracking
- Explore solar power or helmet-mounted battery recharge
- Partner with local safety programs or NGOs for pilot rollout

## 08 Conclusion

The smart boda helmet effectively detects crashes and initiates emergency communication. The results support the hypothesis that affordable, embedded tech can reduce boda accident fatalities through faster emergency response.

## 09 References

- Arduino Document – [www.Arduino.cc](http://www.Arduino.cc)
- SIM800L GSM Module Datasheet
- Uganda National Road Safety Council
- WHO Global Status Report on Road Safety Reports