

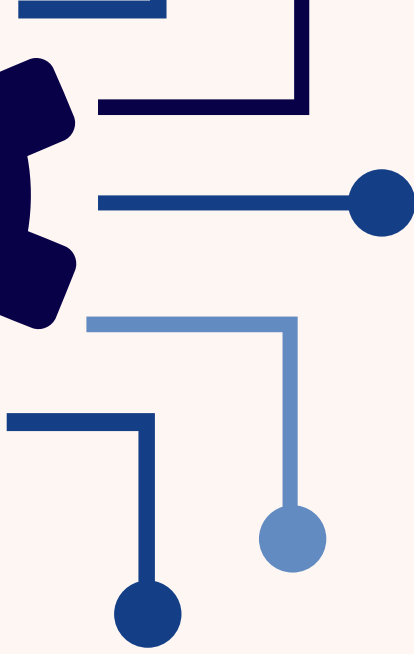
SMART WALKER

OUR TEAM

Lama Hag

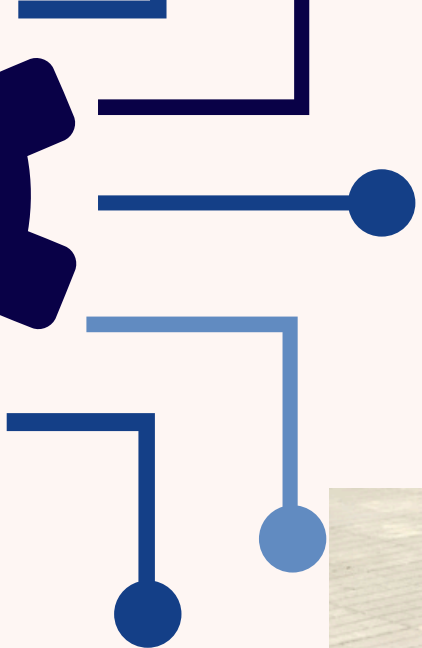
Omar Jarbou



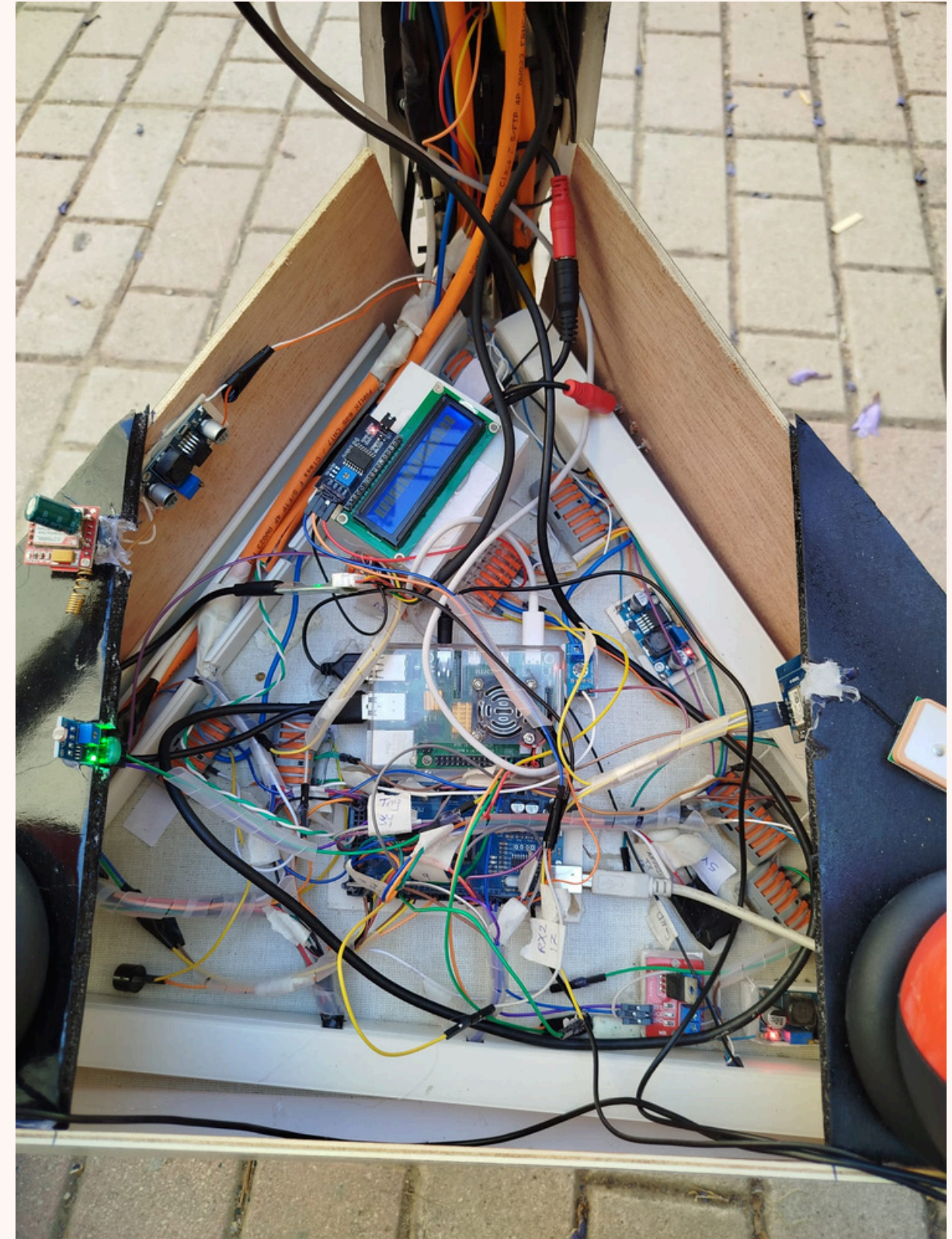


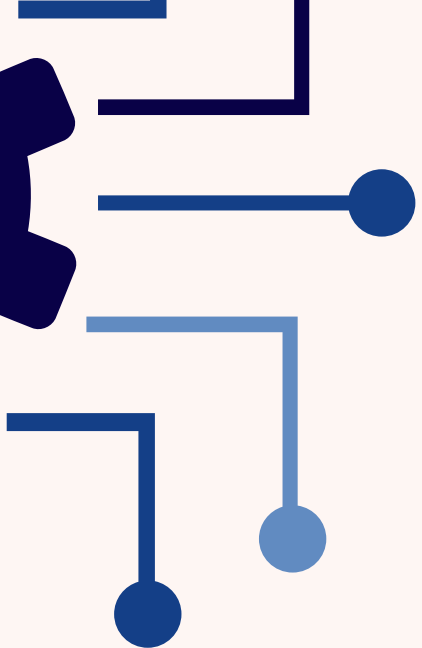
Smart Walker is an intelligent assistive mobility system designed for visually impaired and elderly individuals who lack adequate tools for safe and independent navigation. While traditional aids like white canes offer limited environmental awareness, the Smart Walker integrates LiDAR, an OAK-D camera, and AI-based processing to detect obstacles, recognize objects, and provide real-time voice guidance — empowering users to move through their surroundings with greater safety, confidence, and dignity.





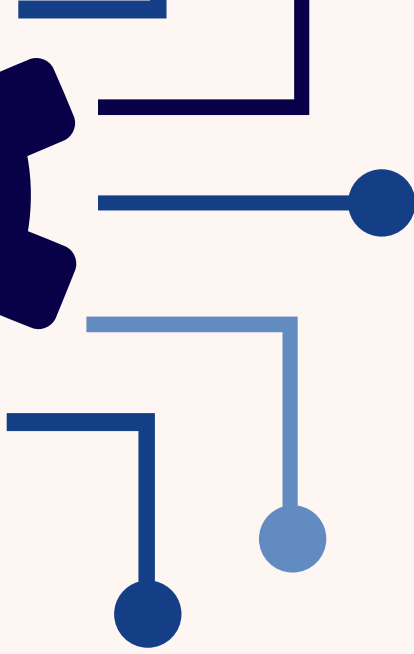
FINAL DESING



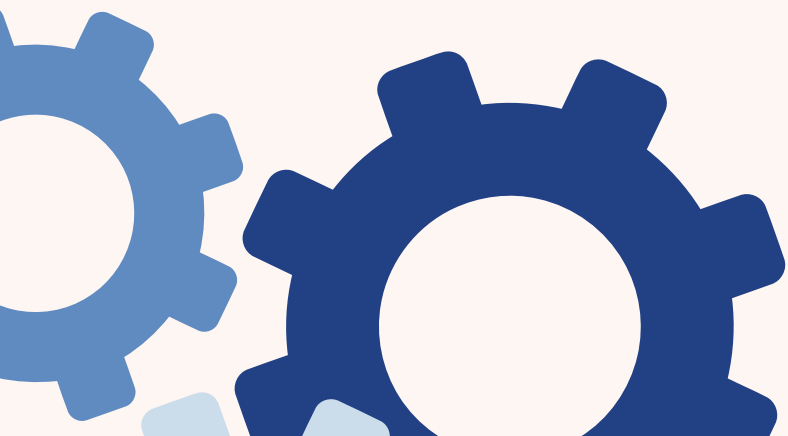


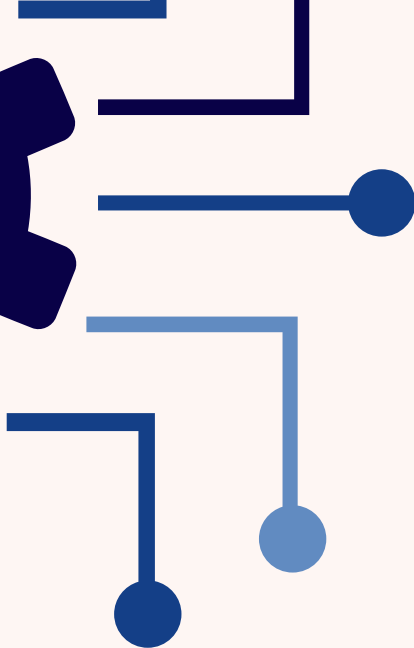
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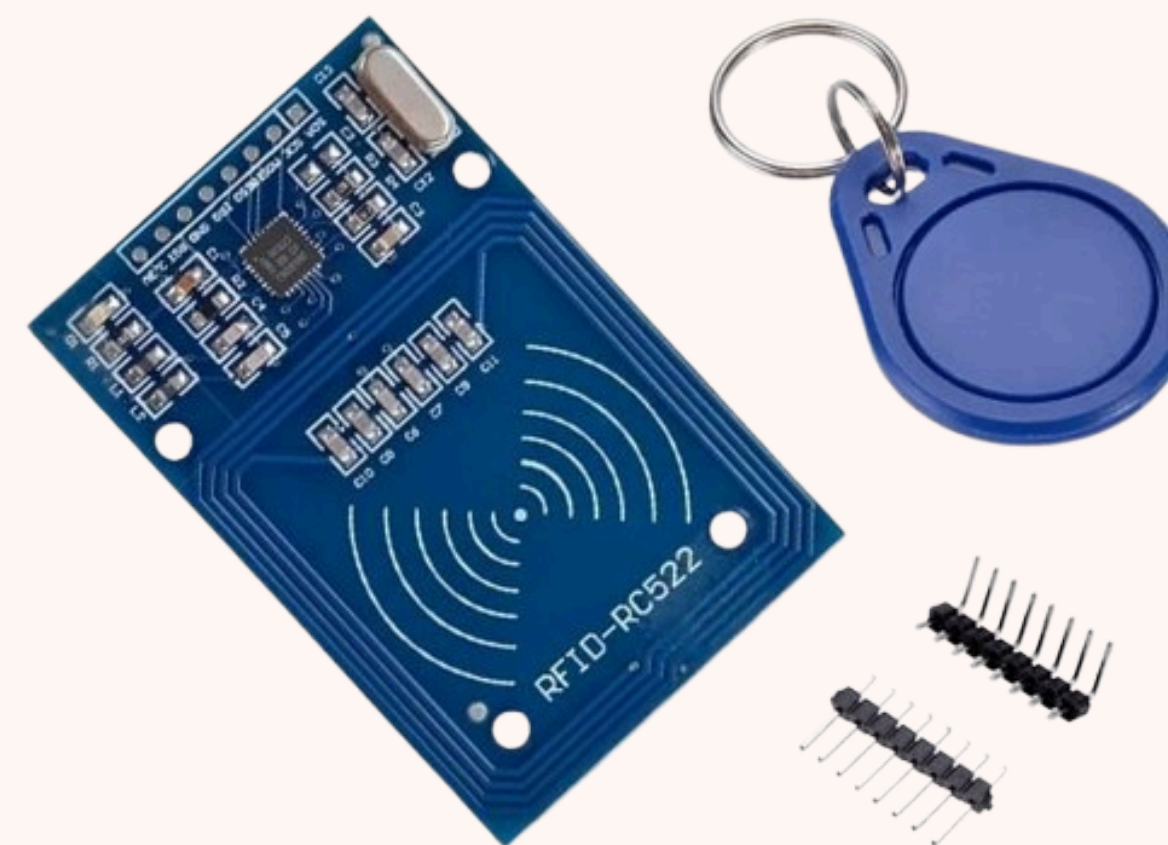


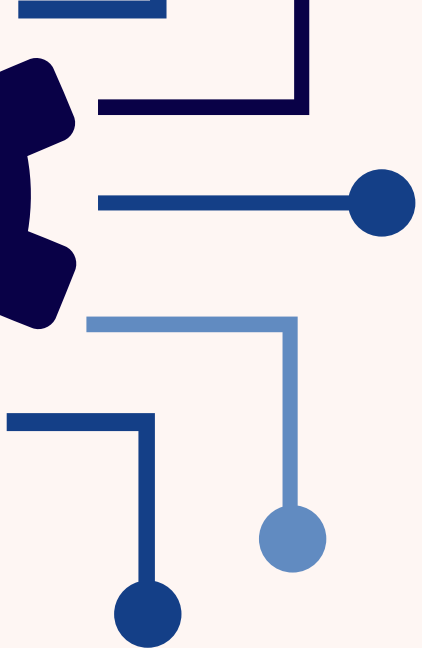
FEATURES IN DETAIL





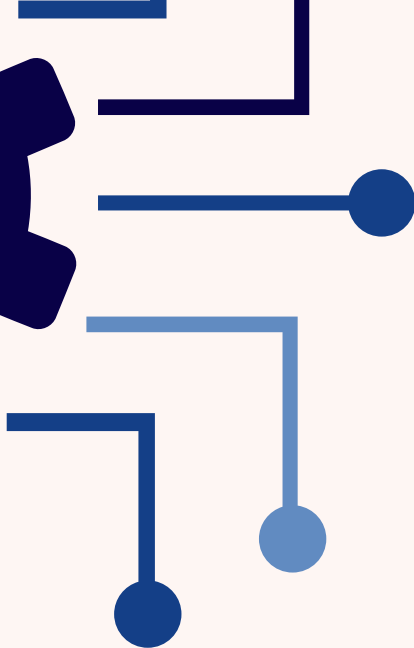
LOGIN(AUTHENTICATION)



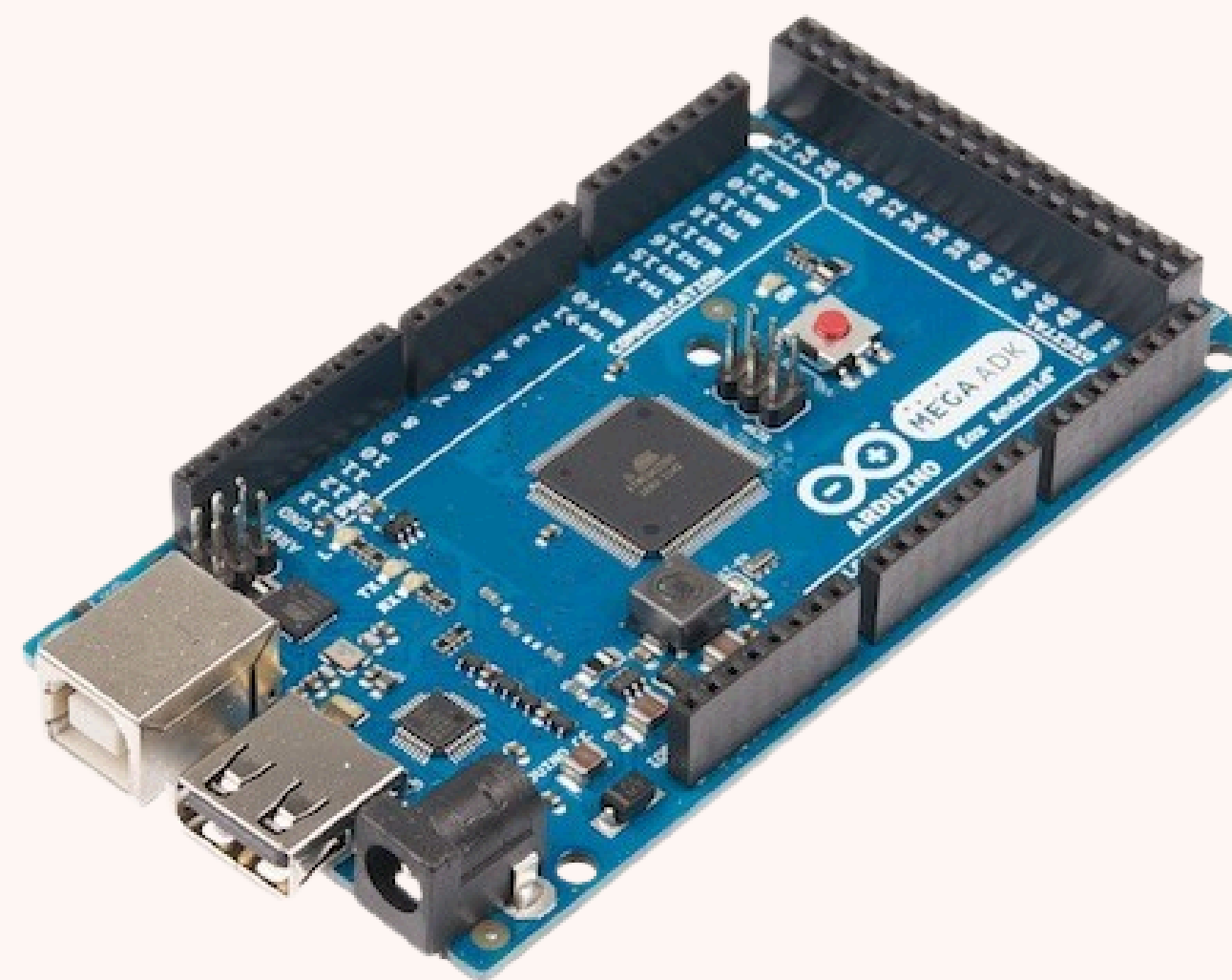


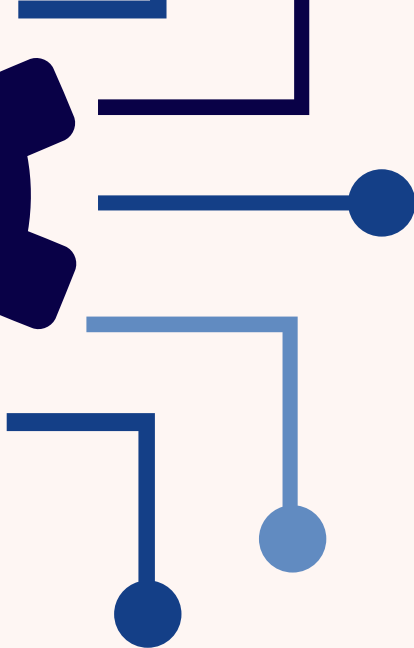
OBSTACLE DETECTION & AVOIDANCE





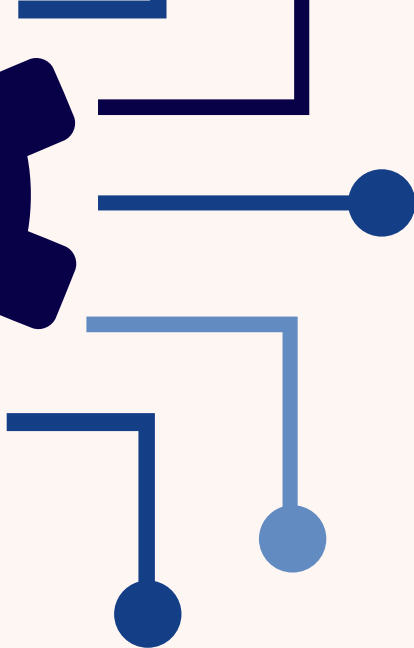
PROCESSING UNITS



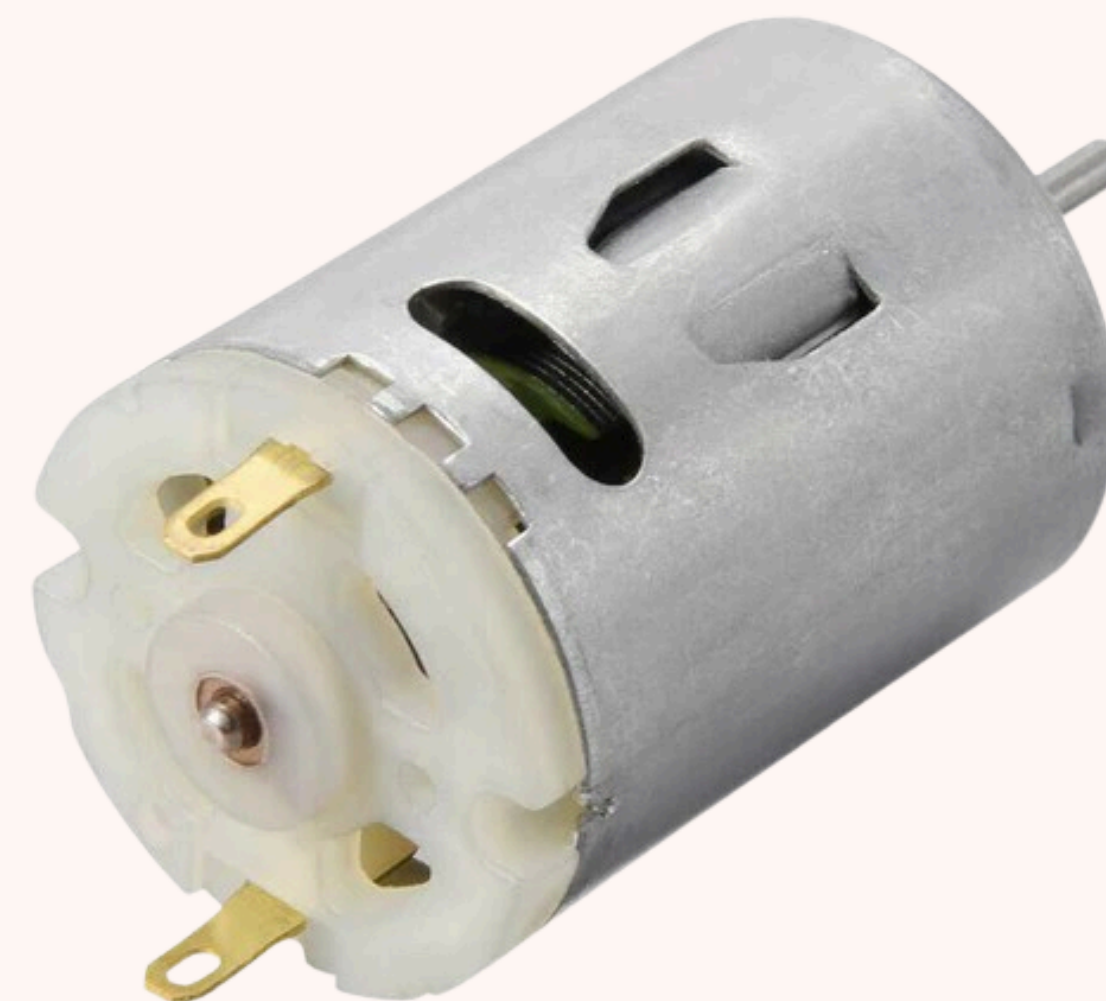


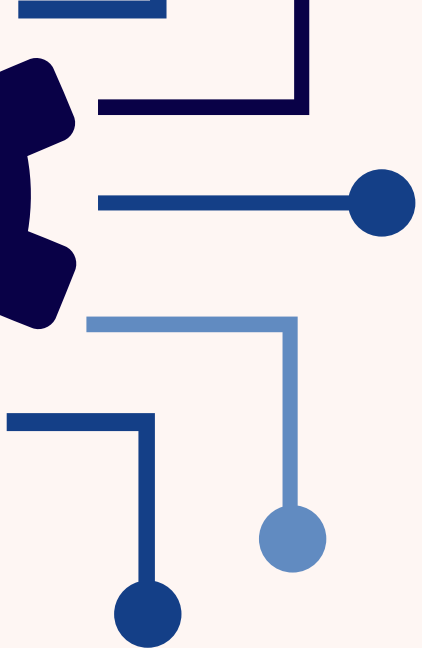
AUTOMATIC BRAKING SYSTEM





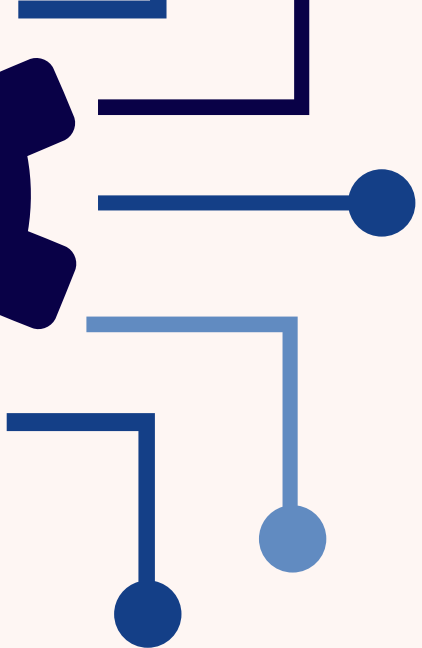
VIBRATION FEEDBACK



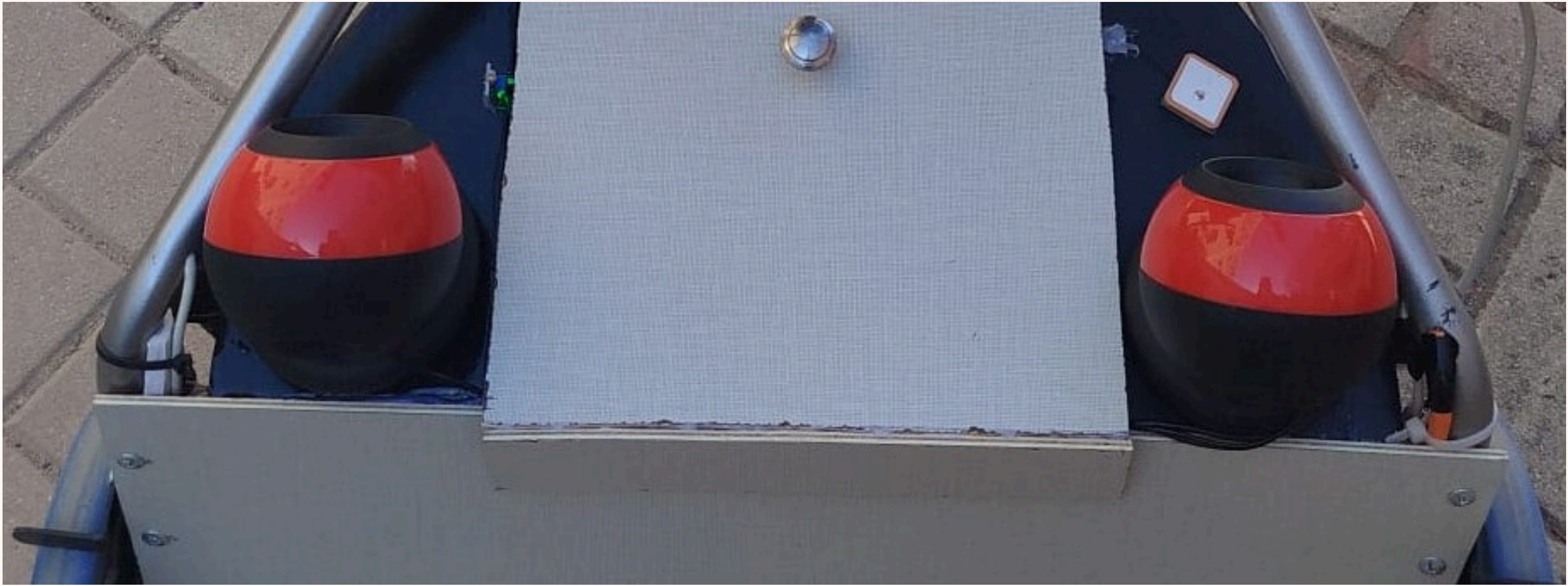


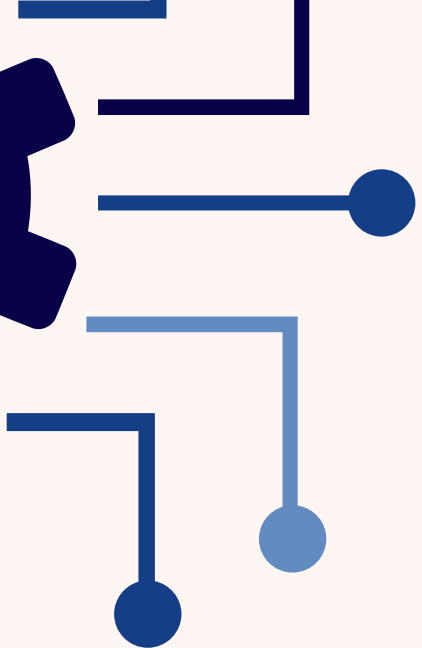
INTELLIGENT STEERING ASSISTANCE SYSTEM



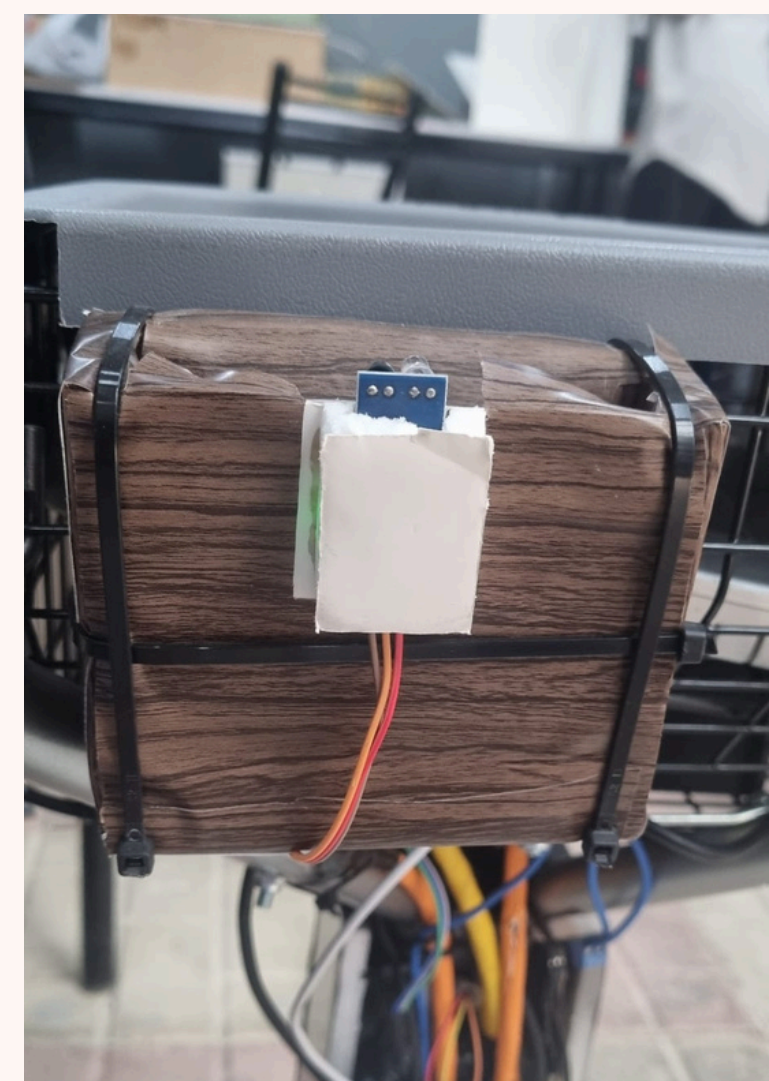
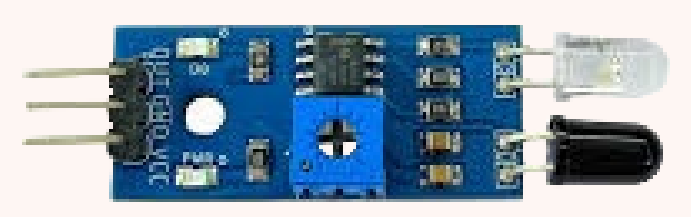
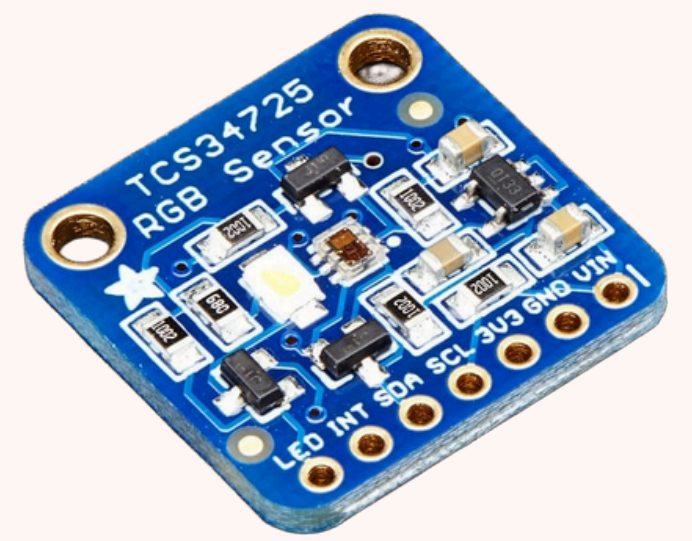


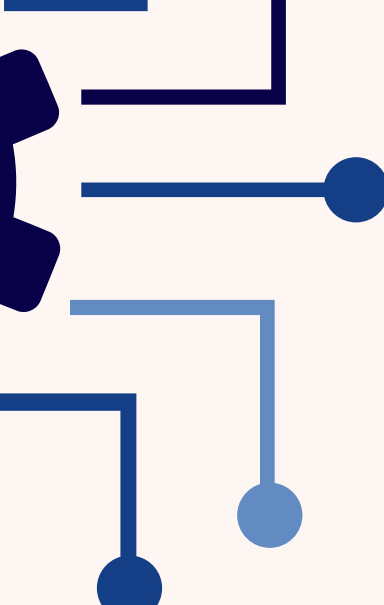
VOICE SYSTEM



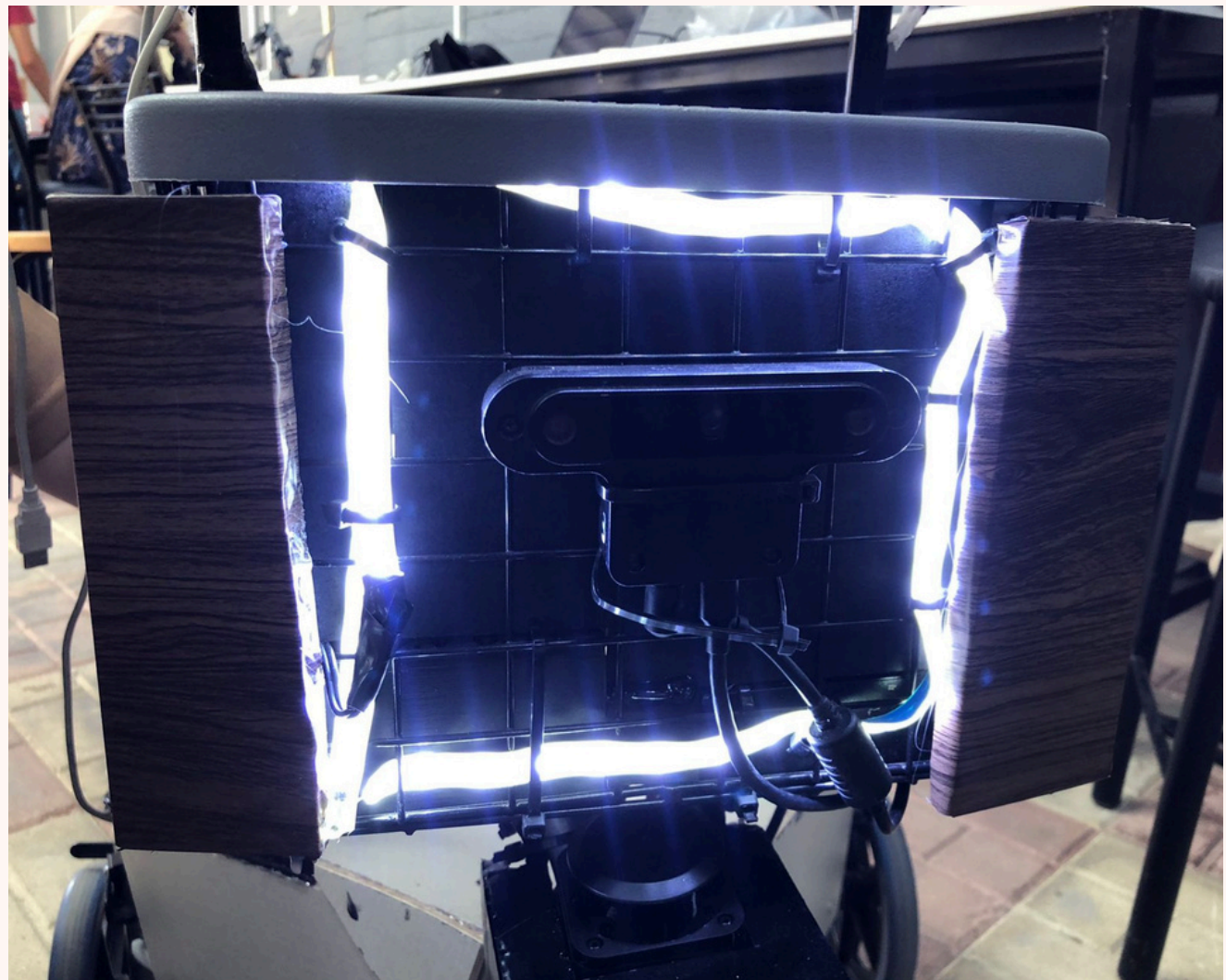
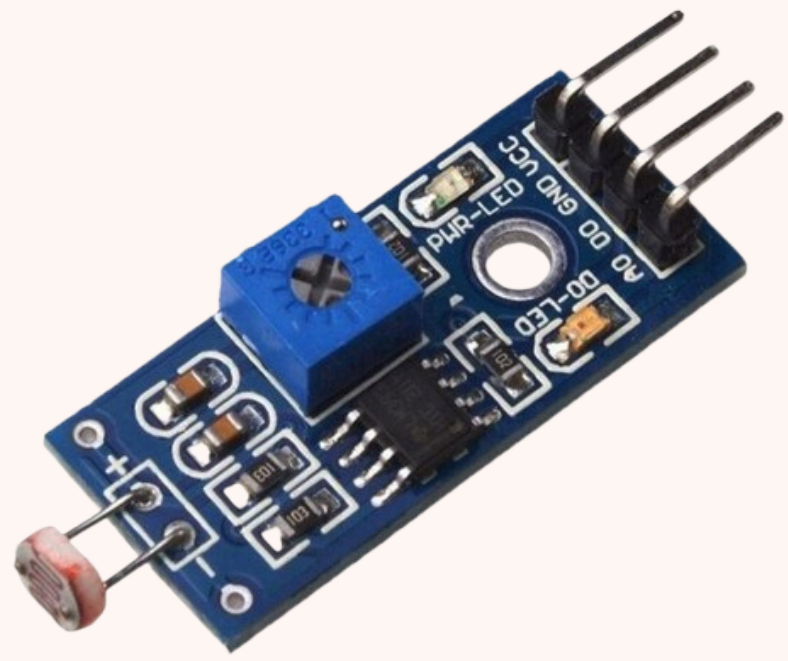


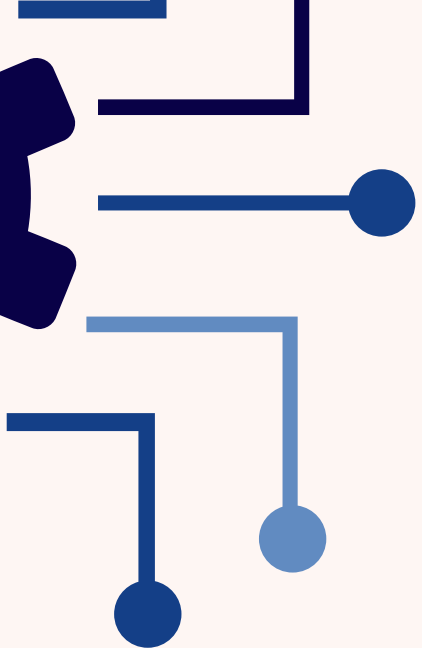
BANKNOTE RECOGNITION



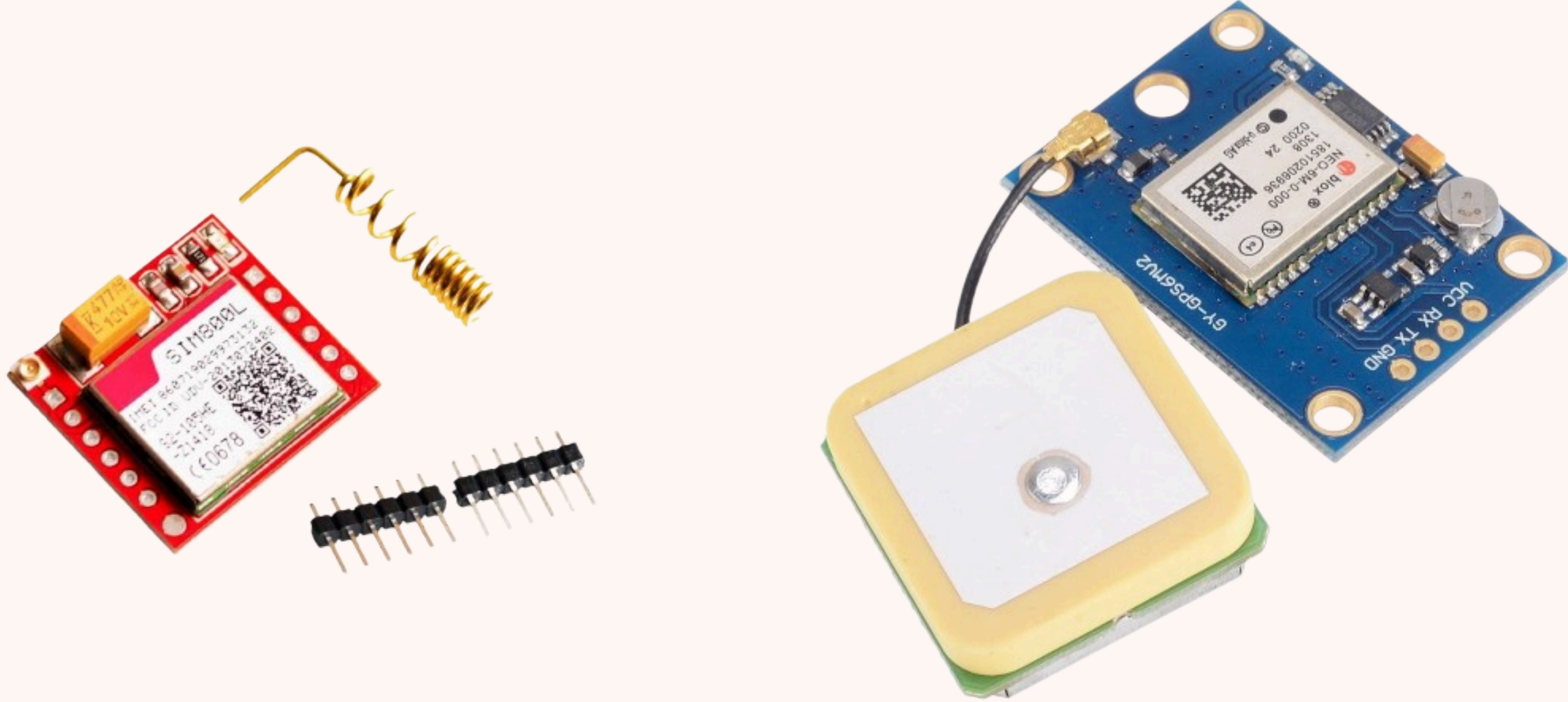


AUTOMATIC LED LIGHTING

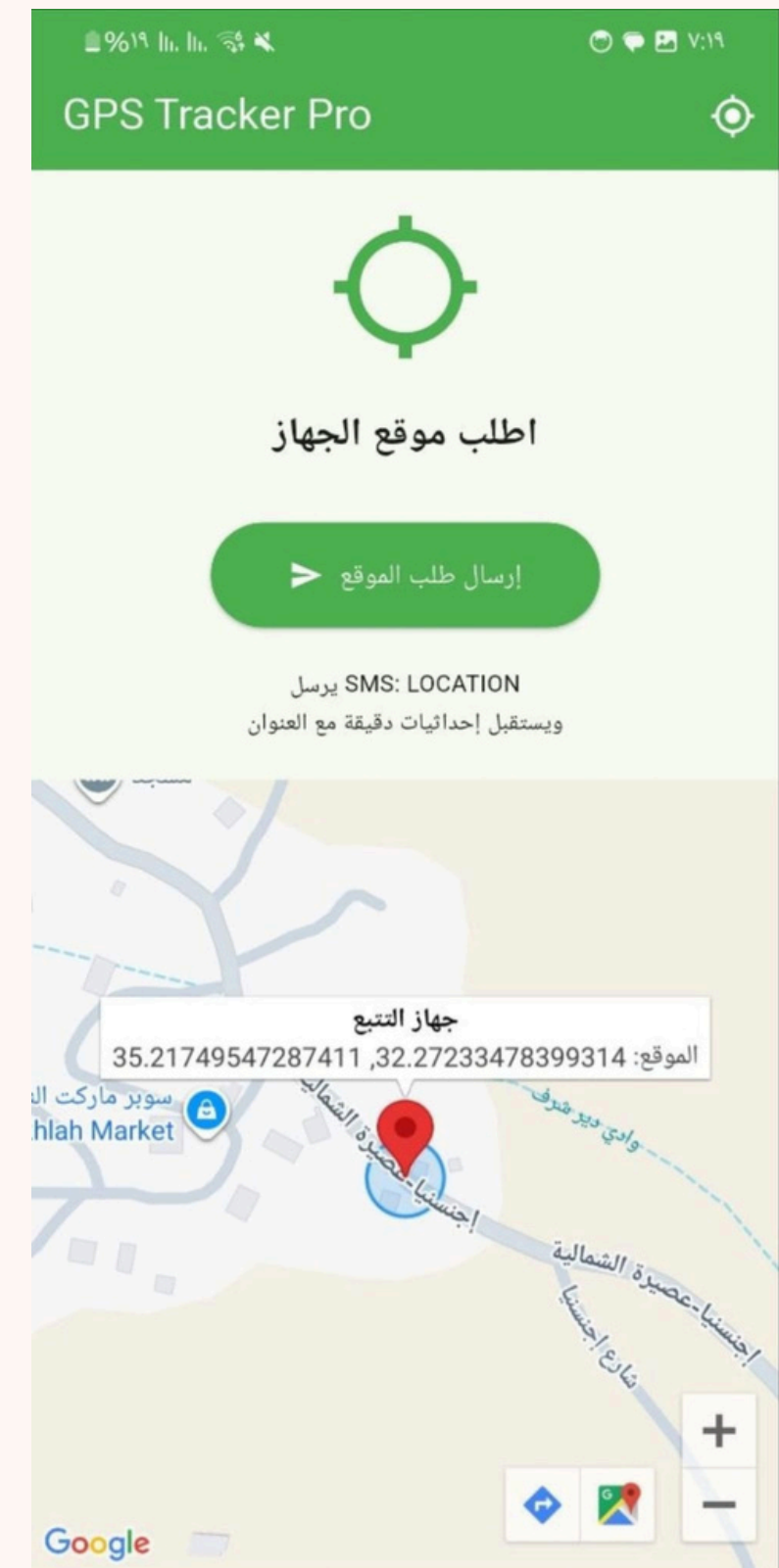
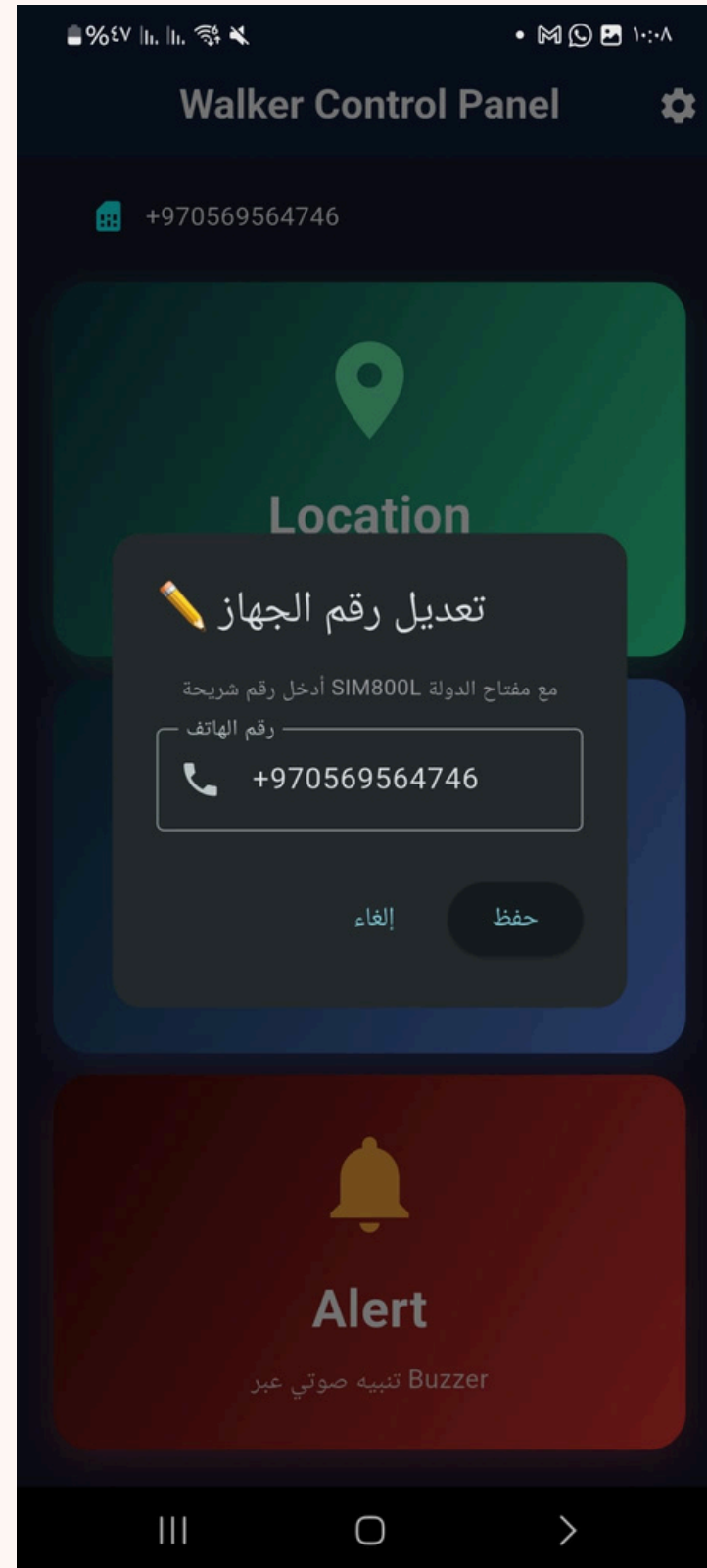


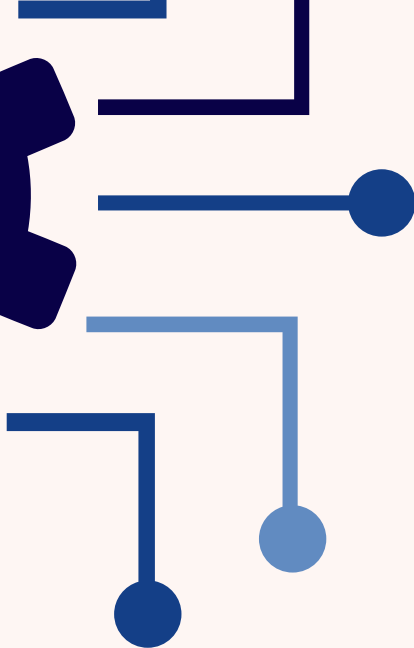


GUARDIAN MONITORING & COMMUNICATION

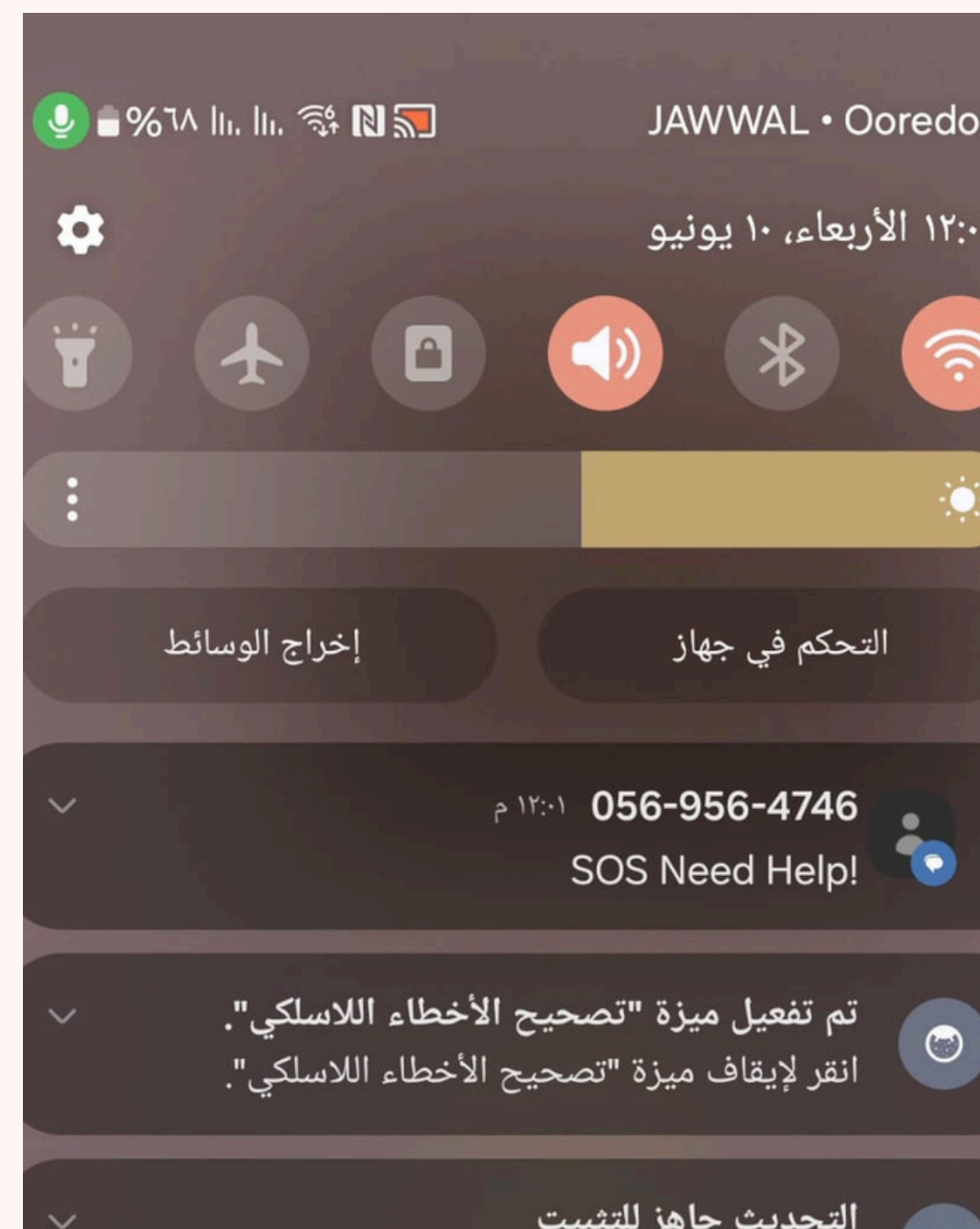


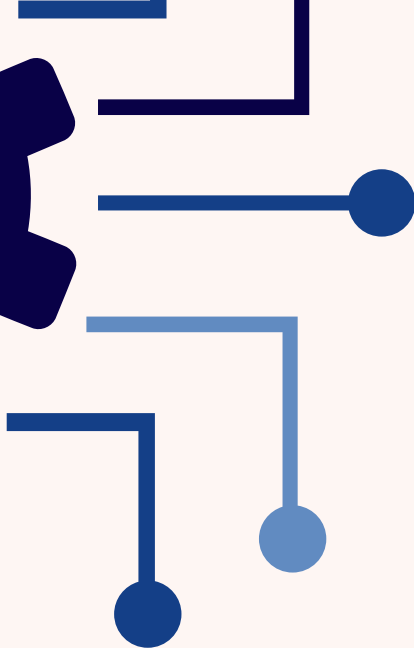
GUARDIAN MONITORING & COMMUNICATION



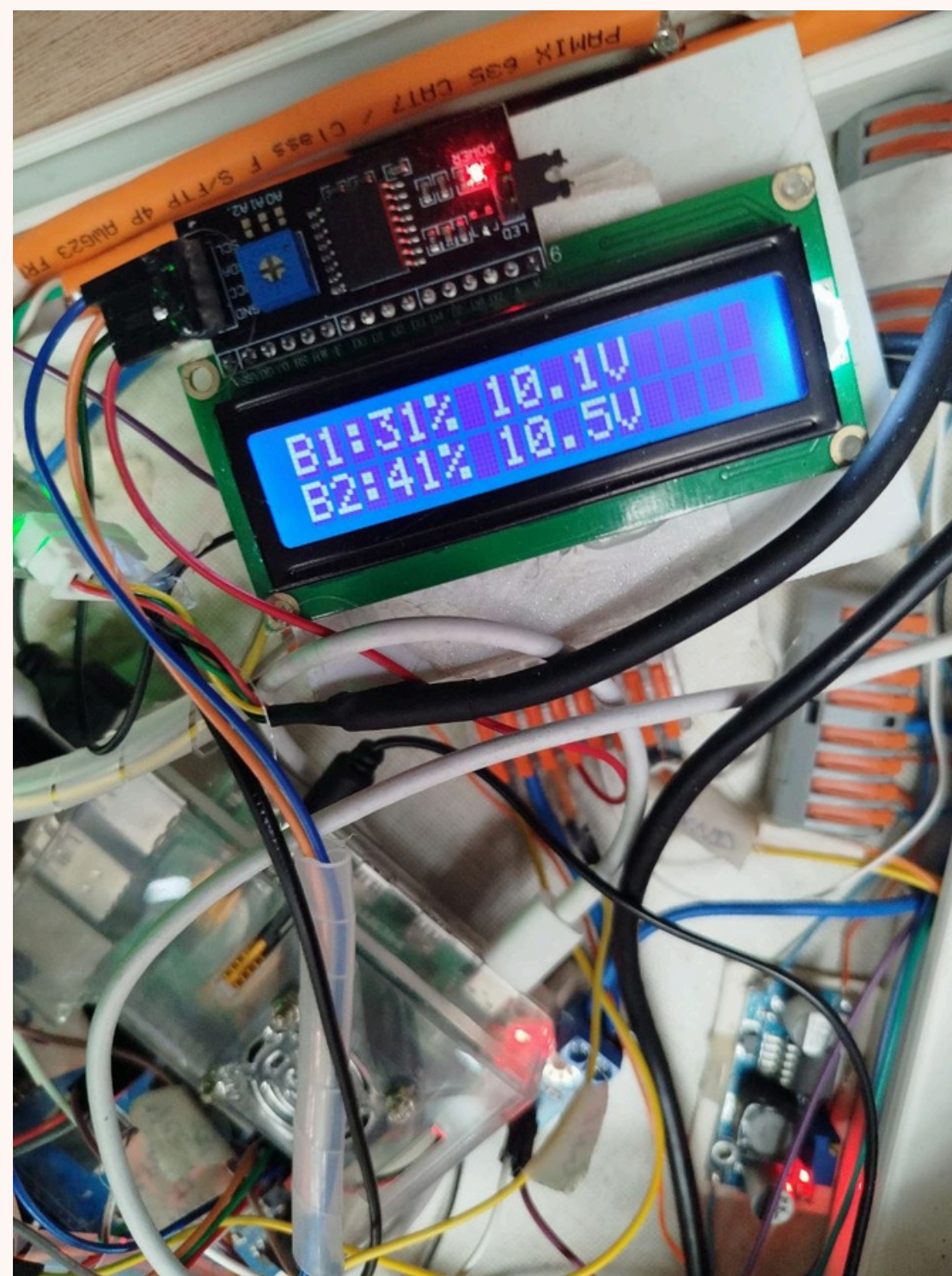


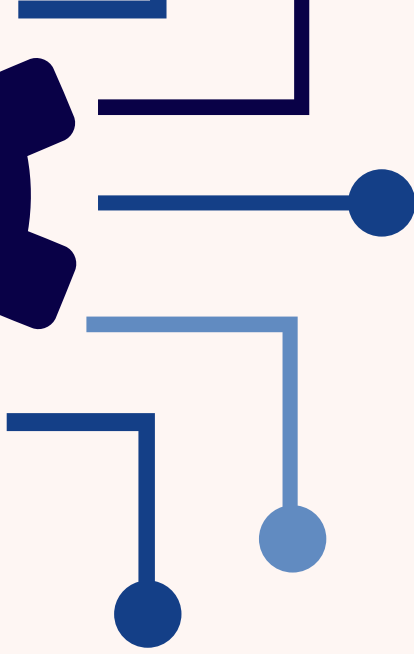
EMERGENCY SOS BUTTON





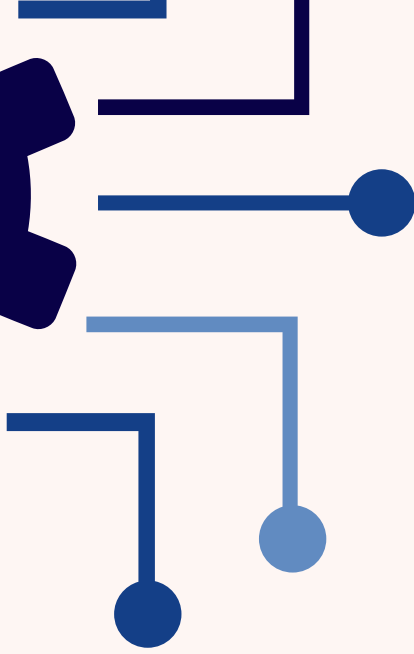
LCD DISPLAY





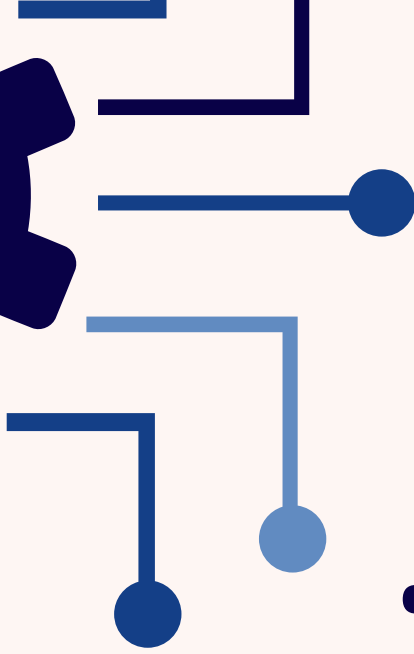
CONSTRAINT

- **Real-time processing requirements for LiDAR, object detection, and control.**
- **Safety-critical operation for visually impaired and elderly users.**
- **Sensor limitations under challenging environmental conditions.**
- **LiDAR is only 2D scanner, which means it can only scan at the level of its position.**
- **Limited budget and hardware resources.**
- **Need for reliable power management and battery operation.**



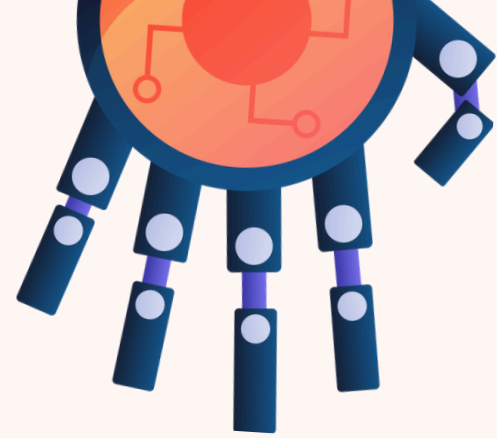
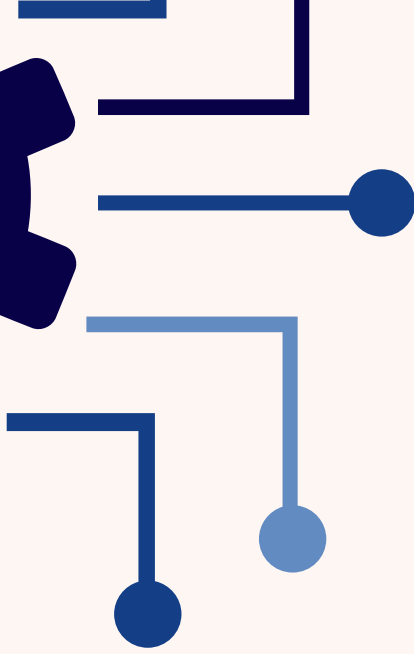
FUTURE WORK

- **Improve obstacle avoidance and navigation algorithms to become more aware of the environment.**
- **Add voice command functionality.**
- **Enhance the mobile application with additional features.**
- **Develop a lighter and more compact walker design.**
- **Improve battery life and power management.**
- **Conduct large-scale testing with visually impaired and elderly users.**

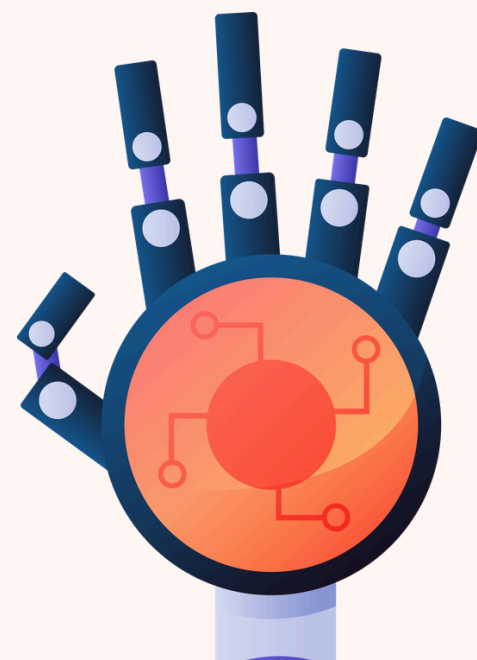
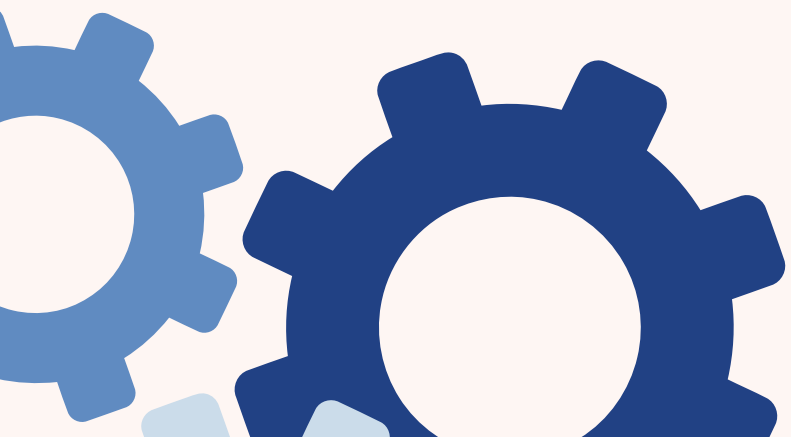


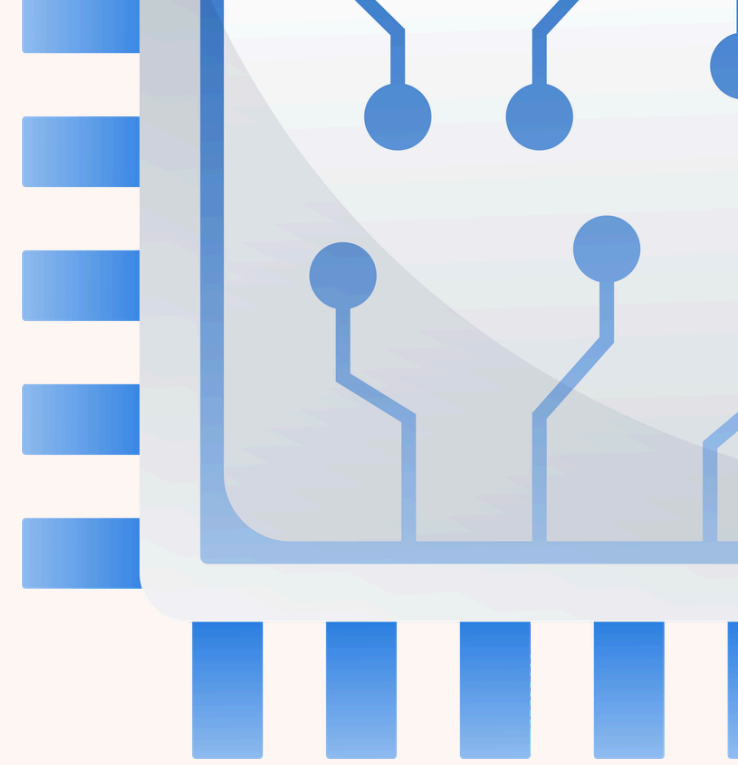
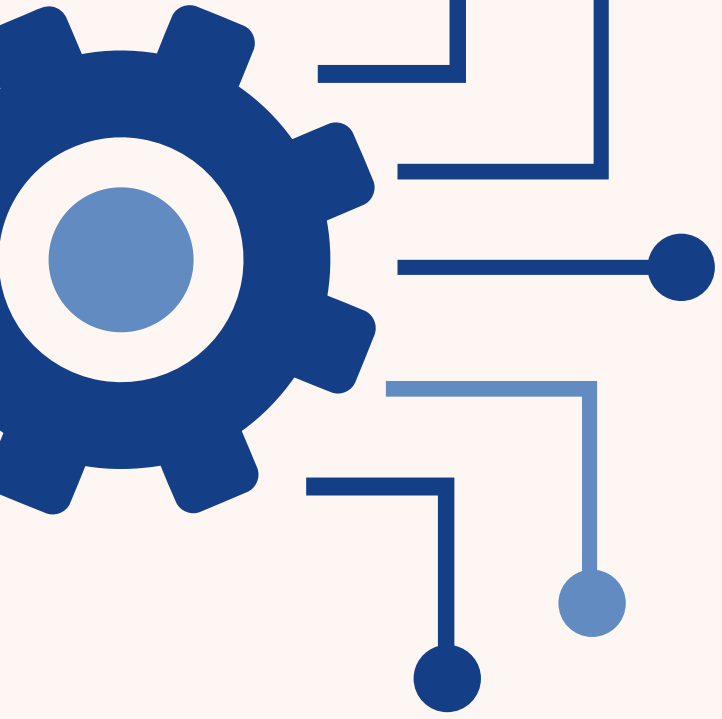
CONCLUSION

- **Designed and implemented an intelligent Smart Walker prototype.**
- **Integrated LiDAR, OAK-D camera, Raspberry Pi, and Arduino Mega.**
- **Successfully provided obstacle detection and object recognition.**
- **Implemented steering assistance, braking, voice guidance, and emergency communication.**
- **Added user authentication, banknote recognition, and remote monitoring features.**
- **Demonstrated a practical and cost-effective mobility assistance solution for visually impaired and elderly users.**



QUESTION TIME





**THANK
TOU**

