

# Smart Locking

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## Abstract

This smart locking project provides four different alternatives for unlocking: keypad, fingerprint, facial recognition and remote e-mail. All these alternatives work in coordination with Arduino and Python communication.

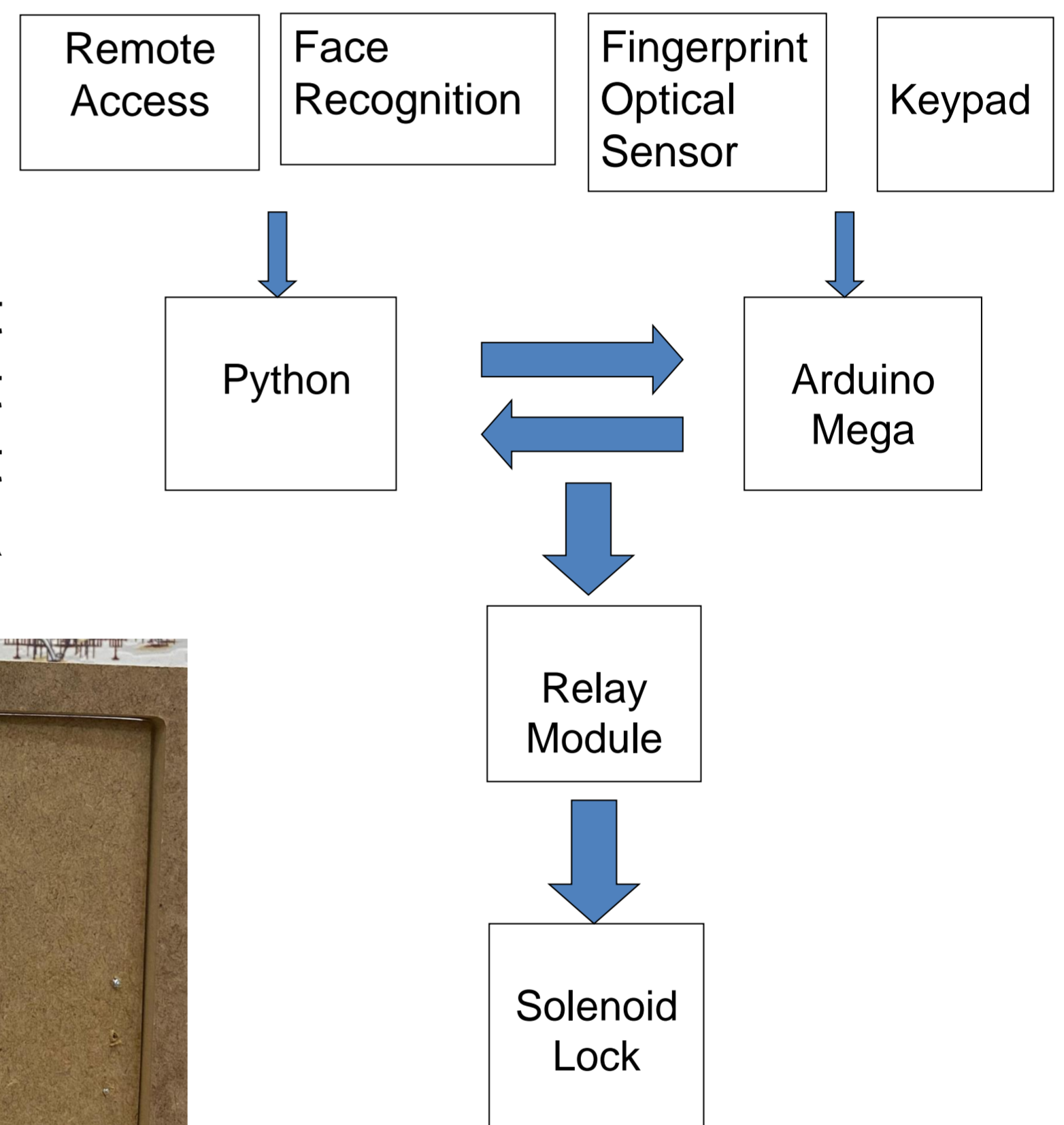
## Smart Locking Options



## Main Components

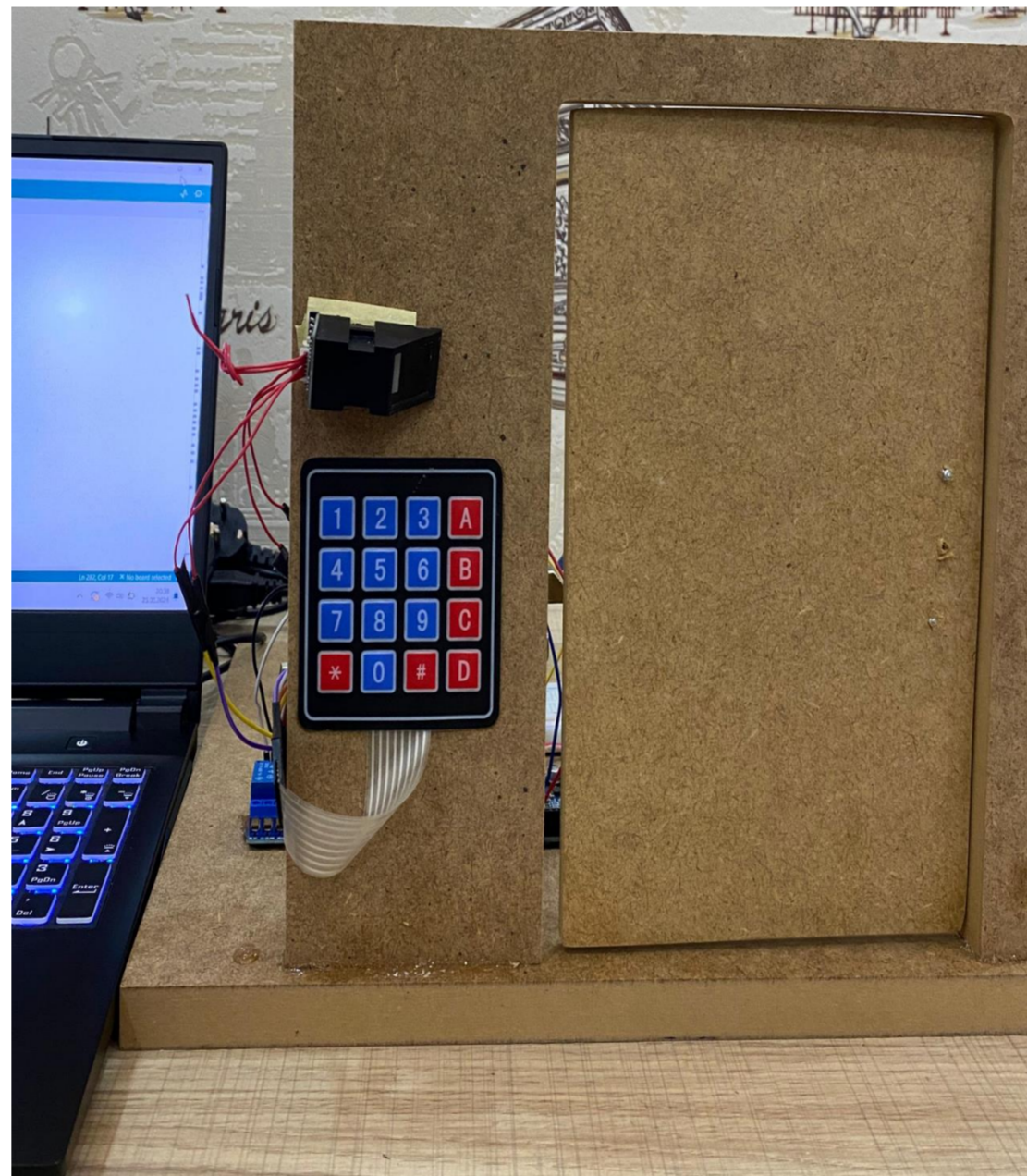
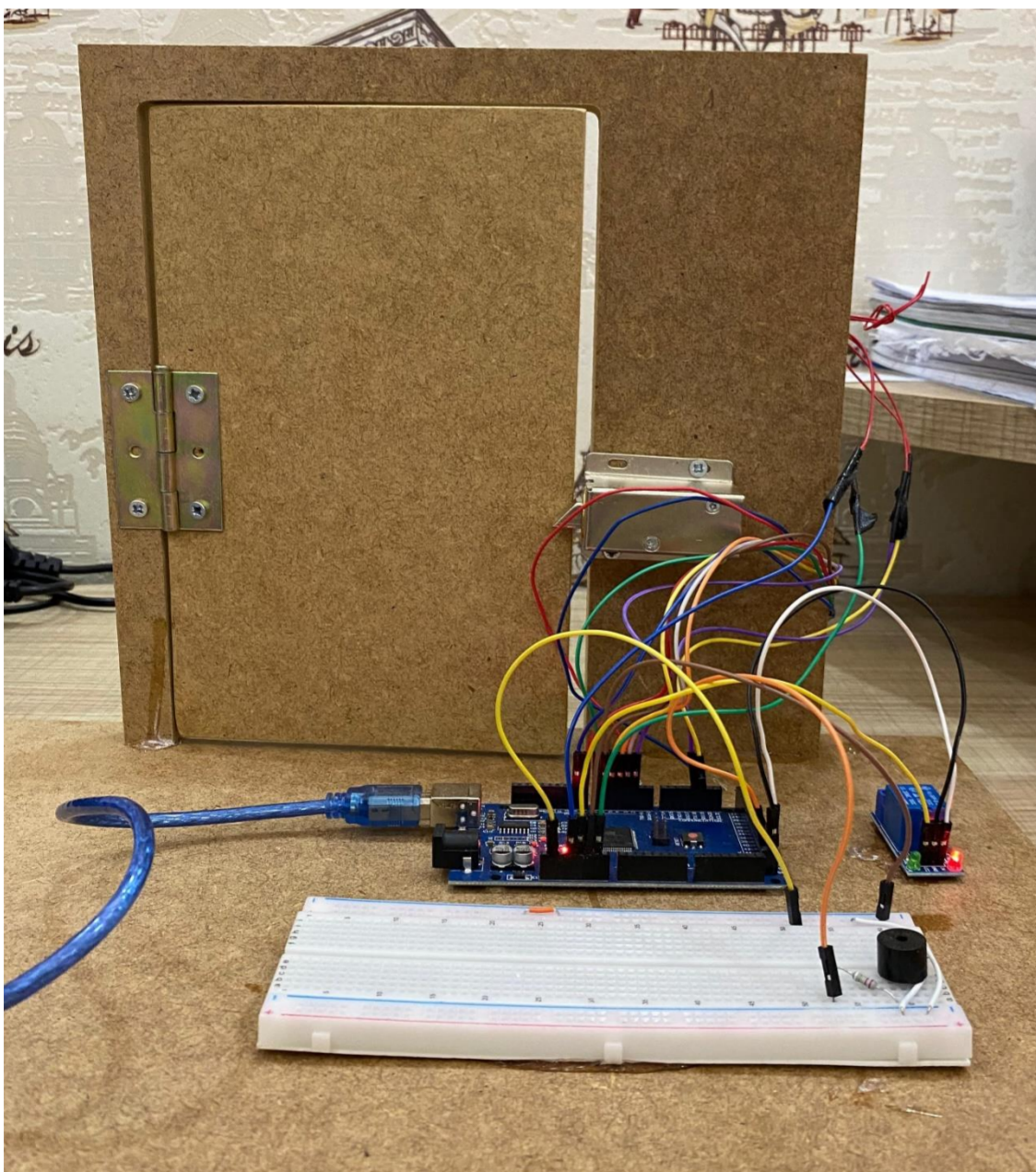
Solenoid Lock, Keypad, PC, Relay Module, Buzzer, Fingerprint Optical Sensor Module FPM10A, Arduino Mega.

## Flow Chart



## Main Process

By ensuring Arduino and Python communication, smart locking system alternatives work in constant coordination. The lock is unlocked when the correct password is provided. If three consecutive incorrect login attempts are made, the user will be notified via e-mail.



## Conclusion

The smart locking system we developed offers high security by combining facial recognition, fingerprint, keypad and remote access technologies. While the facial recognition system verifies identity with advanced image processing techniques, the fingerprint scanner provides fast and reliable access. The keypad serves as a backup authentication method, while the remote access feature allows users secure access from anywhere. With these four layers of security, we offer a user-friendly and effective locking solution.

## References:

<https://www.arduino.cc/> (Take advantage of Arduino's libraries on this site.)

<https://www.python.org/doc/> (Take advantage of Python's libraries on this site.)

[https://www.researchgate.net/publication/339362955\\_Smart\\_Lock\\_Systems\\_An\\_Overview](https://www.researchgate.net/publication/339362955_Smart_Lock_Systems_An_Overview)

<https://dergipark.org.tr/tr/download/article-file/394623>