RUTGERS
School of Engineering

RFID Home Automation Control
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Objective

- Design a user-friendly automated home control system which provides heightened security and convenience to the customer with the use of RFID technology.
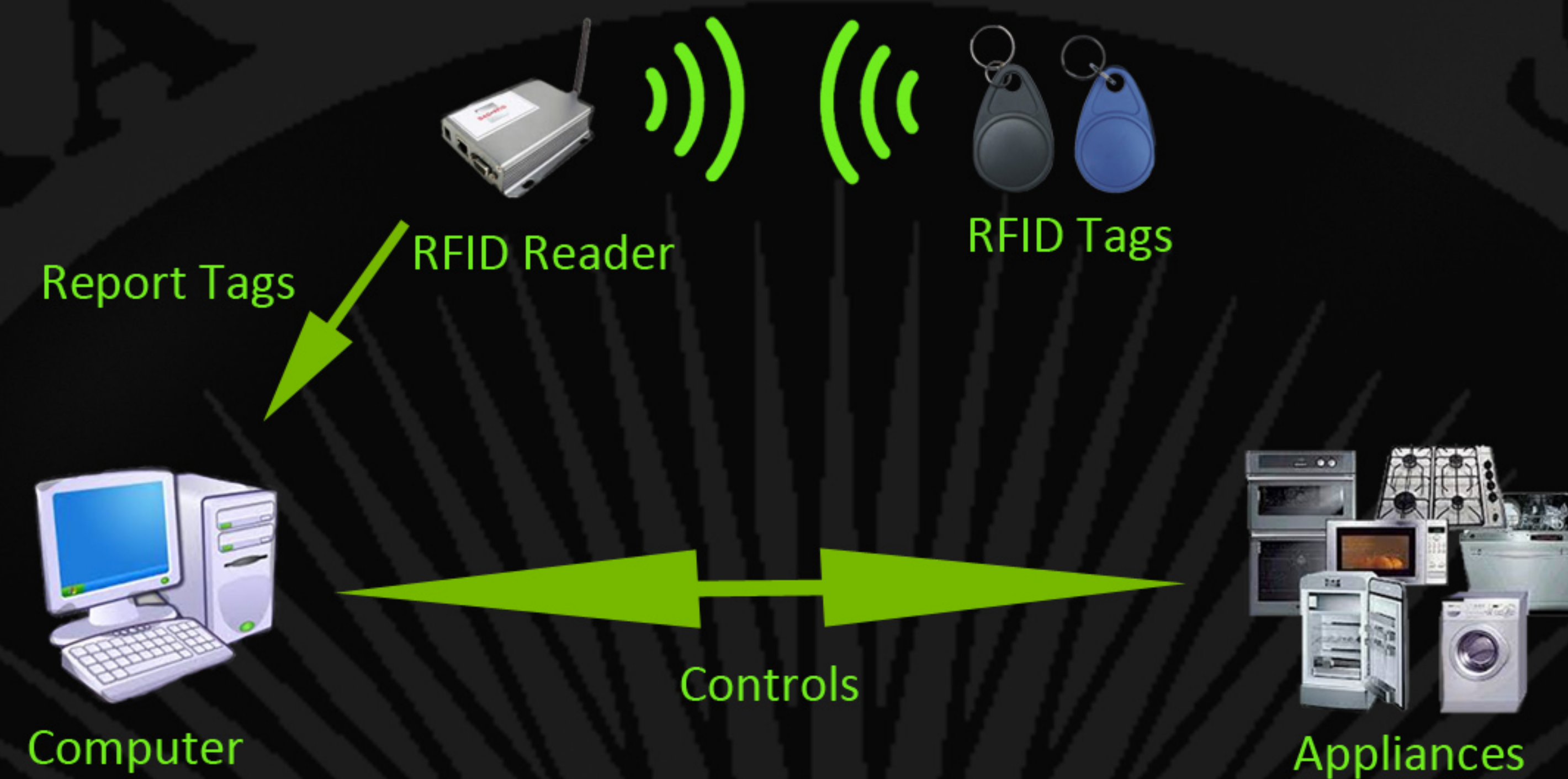
Introduction

- RFID Automated home system provides a simple and convenient method for home management which demands minimal manual control requirements.

- From unlocking doors to controlling temperature, the RFID Home Automation Control System handles most of the simple but annoying daily tasks automatically in order to reduce user's burden in managing their homes.
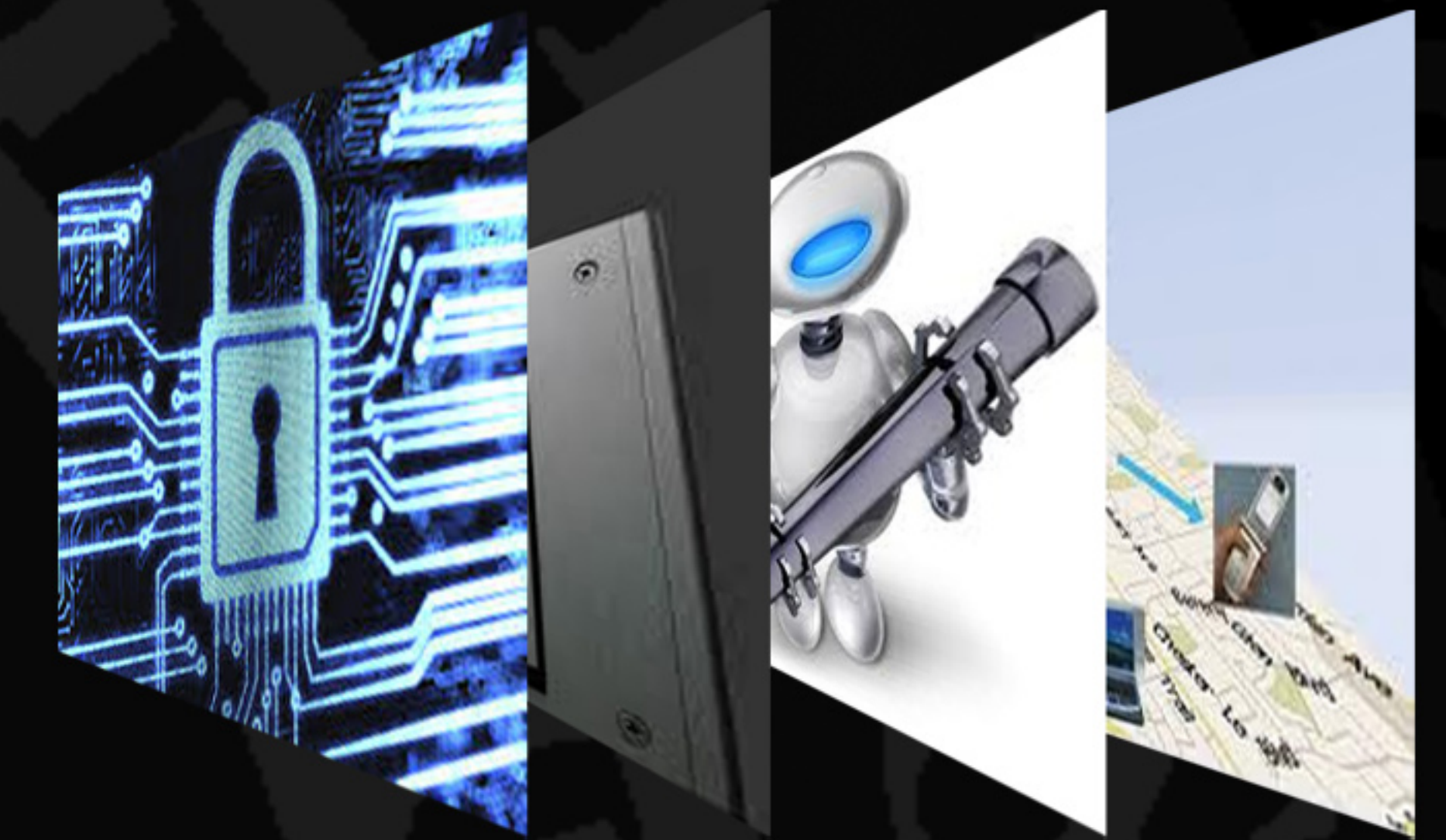
System Architecture

- The system consists mainly of two components: the main controller (computer in this case) and the RFID reader connected to an Arduino, which is then connected to the controller.

- The controller acts as the component which does most of the device control in response to the tags read by RFID readers. The RFID readers are only responsible for reading and reporting the RFID tag ID to the main controller

RFID Reader

RFID Tags

Report Tags

Computer

Controls

Appliances

Challenges and Resolutions

Useage Challenges
- *Issue*: False triggers
- *Resolution*: Provide manual override options

Hardware Limitations
- *Issue*: Amount of tags that can be read by readers.
- *Issue*: Read Range
- *Resolution*: Replace with higher-end RFID readers

System Functionalities

- Allow/deny the entry of another being into the house or certain areas of the house.
- Turn on/off and accept/deny the usage of different devices and appliances.
- Change and manipulate the use of different devices and appliances.
- Recognize threats in the house and warn others of the threat.
- Track and display the location of certain objects.
- Notification of entrances, exits, and all critical utility and environment events.

Framework

Hardware
- Arduino Uno Microcontroller
- Sparkfun ID-12 RFID Reader

Software
-Java
--C++

Development Tools
-Eclipse
-Arduino Environment