IoT Course

Capstone Project   
Action Plan

For students (instructor’s review required)

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| Course | IoT Course |
| Team Name | IOT1 ICTU |
| Team Leader/  Members | Le Minh Huu /  Duong Van Nam, Bui Thi Trang, Nguyen Thi Minh Nguyet |
| Project Title | Smart Home Automatic Control of Fan and LED Lights |
| Goal |  |
| -Develop a smart home system with features including gas leak detection, control of household devices such as fans and lights, and indoor temperature and humidity monitoring.  -The system can be controlled via voice commands or an app on mobile devices. | |
| Abstract |  |
| -Develop a smart home system that monitors temperature, humidity, and gas levels in the air, and automatically controls devices such as lighting and fans. Additionally, the system can be controlled via a mobile app or voice commands. | |
| Method |  |
| Utilizing an embedded computer, Raspberry Pi 4, combined with a DHT22 temperature and humidity sensor and a gas sensor as input signals to control actuators including a fan and lighting.  Hardware includes: Raspberry Pi 4, display screen, temperature and humidity sensor, gas sensor, lighting, fan, relay, and microphone.  Software includes: An Android mobile application connected to the Internet, displaying information on the screen and mobile phone, including temperature and humidity. Control of lighting and fan via the mobile phone or voice commands. | |

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| Data |  |
| Data from temperature, humidity, and gas sensors is transmitted over the Internet. | |
| Expected  Outcome |  |
| -Develop a scaled-down smart home model with functionalities including gas leak detection, temperature and humidity monitoring, and control of devices such as lights and fans. The system can be operated via voice commands or remotely through a mobile app with an Internet connection.  -Benefits: Enhanced safety for the home and smart, efficient control of devices. | |
| Role by  Member |  |
| Le Minh Huu: Team Leader, Embedded Hardware Programming  Duong Van Nam: Hardware Model Design  Bui Thi Trang: Report Preparation, User Training and Support  Nguyen Thi Minh Nguyet: Android Application Development | |
| Schedule  Summary |  |
| Phase 1: Ideation, Component Research, and Document Compilation  Phase 2:  Researching Raspberry Pi 4, familiarizing with the development environment and GPIO Zero, RPi libraries  Understanding the operating principles of sensors and related components  Designing algorithm flowcharts and building block diagrams  Phase 3:  Connecting each component, sensor, and actuator with the Raspberry Pi  Embedded hardware programming and mobile application development  Phase 4:  Product testing and debugging  Compiling documentation and reporting | |
| Comment &  Assessment |  |
| <Comment and assessment **by the instructor.**> | |