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CS3130

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CS3130 Project Proposal

My proposed project is a proof of concept smart home server. It consists of a raspberry pi running a login interface that allows a user access to motor controls, relay switch, and sensors like gas, camera, and motion. Motor functionality can be imagined for turning a deadbolt in a door. The gas sensors will be used to determine if certain concentration of gases are high enough to warrant an “alarm” that will trip the relay switch and shutoff power to the offending device (eg. oven). I will be developing the login interface and underlying functionality.

Scenario:

Bob put his roast in the oven and left for a quick trip to town. He knows that his roast will take a certain time and since his trip will be short, he will be back in time. While in town, an emergency arose and he forgot about his roast. Bob knew about this possibility and was going to log in to his home server and manually shutoff his oven should the emergency arise, but he forgot. Meanwhile, the sensor alarm has occurred and has shut off power to the oven while also sending him a message on his computer. Bob is now concerned about his oven and house and asks his neighbour to check on them. He unlocks the door remotely for his neighbour who is then able to verify that his roast is burnt but his oven and house is safe. His oven will just need some cleaning before next usage.

Additional notes:

* Remote control/monitoring, motor controls, relay switch, and gas sensors will be implemented as a minimum.
* Port forwarding will be needed. Potential problem with ISP giving dynamic IP’s for residential internet service. Also, ISP router configuration may be a problem as username and password will be needed. May only be able to implement remote functionality within local area network.
* Everything else like camera and motion sensors are extra and not guaranteed to be implemented.
* Fail2ban may be implemented depending on time.