**Proposals for Practicum Projects**

1 Automatic pet food dispenser:

This device would be filled with some type of dry pet food. The device could be set for different amounts of food delivered per time interval, depending on the size of the animal. The dispenser could be set to feed multiples times in a day. The device would consist of a tower to store large amounts of pet food, a funnel that has an opening that can open and close, a clock that could be programmed for certain times, and an actuator that would open and close the funnel. The funnel would be programmed to open for a certain amount of time depending on how much food should be released.

2 Shock Ball(hot potato game):

This concept came form the game hot potato that many of us played as kids with a little bit of danger involved. The game would be programmed into a microprocessor that is in-bedded into a soft ball. The ball would have a screen that would either have a numerical or audio count down to show that the "potato" is getting hot. When the ball become "hot" it will generate a small shock that will let the person holding the ball know they are out. After a predetermined amount of time or by pressing a button the game will again begin. Other possible add-ons for this project could be things like flashing lights, different game modes, and level of shock. These are all "may's" for this project if time allows.

3 Bicycle Lighting System:

This project is essentially a "smart" lighting system for a bicycle. It would serve to improve visibility for the biker and visibility of the biker. The lighting system would include an arduino for control, sensors to detect motion, visibility level of the bikes surroundings (detect if it is dark outside), and lights in the front and back of the bike. The lights would automatically come on if the system sensed motion of the bike (if the bike is being ridden upon), and additional lights would come on once the surroundings became dark. Another feature would be blinkers and braking lights on the back of the bike. An additional idea being tossed around is to include a proximity sensor that would detect incoming vehicles and so that the system could flash/shine extra bright lights to the incoming vehicle.

4 Thermal Monitoring System:

Abstract

A common error occurring in busbar systems is overheating and electrical faults that can result in a dangerous arch flash. These busbar connections are often found in closed environments that are sealed off from the power station. Often these types of faults are not caught in time and require a maintenance worker to open the enclosure; current faults may still be active which could potentially kill the worker if proper safety measurements aren't followed. In order to prevent this damage to the busbar and worker, a thermal sensoring system should be incorporated to this enclosed systems to monitoring temperature along with current. If a thermal sensoring system is incorporated to the busbar system along with contentious monitoring it maybe able to prevent future problems and potentially prevent workers from getting hurt. Often times there may be faults or problems from switchgears that control the current and voltages in these busbar systems.

Busbars and Switchgears:

A Switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect, and isolate electrical equipment. Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream. This type of equipment is directly linked to the reliability of the electricity supply. Busbars are a long bars that conducts electricity within a switchboard, distribution board, substation, battery bank, or other electrical apparatus. Its main purpose is to conduct a substantial current of electricity, and not to function as a structural member.

Problems with Busbars Connections and switchgears:

Often time switchgears and busbars may encounter problems as they age with time. More then often these switch gears may corrode depending on type and may not be able to protect the busbars. Busbars may not be torqued down enough and cause a rise in temperature and as they loosen up, it may even cause arch flash and send a fault to a large wire. Again, these busbars are in a enclosed system and may not be caught in time.

Use of thermal/current system:

Implementing these sensors on various parts of the busbars will help catch these problems. Utilizing several current and thermal sensors connected to arudino and using a LCD screen as a actuator could help workers detect these problems without having to open dangerous enclosures. The system will work along with a program designed for the continuous monitoring. This will be faster and cheaper then utilizing IR cameras.