ICOM 4217 Pre-Proposal

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Team Members

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The design I have in mind uses a micro-controller to verify if stored insulin meets the normal and emergency guidelines for insulin storage. This design would be useful in regions where the power infrastructure is unreliable and post disaster conditions are frequent. The end goal of this design is to create a prototype using a micro-controller, detect the current temperature using a temperature probe and log to a removable storage the recorded temperatures the at specific time intervals. If the micro-controller detects there is AC power being supplied from the electrical grid it verifies if the insulin meets the normal guidelines for insulin storage, i.e that the insulin is less than 2 months in storage and has been kept consistently between 2 and 8 Celsius. When AC power has been lost, the micro-controller switches to the emergency guidelines for insulin storage, i.e 15 to 30 Celsius for less than 4 weeks. The time sensitive nature of this problem necessitates a low power solution, that can make decisions on the fly while maintaining an accurate real-time clock. Some of the features include An uninterruptible power supply in order switch from AC to battery power when AC power is lost, micro SD port to log the temperatures registered by the sensor and a display to show the remaining time of the insulin still meeting the guidelines and a buzzer to alert the user if insulin has been possibly frozen and/or exposed to high temperatures. The end goal for this proposal will be a design that uses a micro-controller, a temperature sensor, a segmented display and removable micro SD storage to log, monitor and inform the

user if the insulin has been possibly outside the safety guidelines.

Insulin Temperature Warning System Client

Kali Villegas (Temperature sensitive medication patient) 787-669-1130.

Potential Project Description Guillermo

The design in mind is using micro-processors to create a machine that is able to fold clothes after being washed just by placing them on top of it by using a foldable surface with small motors integrated for it to manage the correct foldable pattern. It will be able to detect what kind of cloth is by using infrared cameras or a similar technology and with this, it will be able to choose the correct pattern to fold the cloth. This design could be useful in different settings but I would like to focus on situations were the user needs it because of a restriction that could be age, where doing repetitive actions could be tiring, or it can be used with people with certain medical conditions like fibromyalgia where moving their bodies becomes painful, specially when making pressure with their hands becomes difficult, or staying seated or standing for long periods of times causes pain. The need and motivation that creates the problem is the fact that there are people out there that even when doing simple chores like this one, will have negative the consequences on their bodies. This design will be able to reduce those negative consequences. The problem being addressed is the difficulty for people with certain medical conditions when folding clothes and the solution scope in mind is an automatic process that folds the clothes for the users.

Who is your client (position and contact information)?

Guillermo

- Client: Gisela Deliz Bernardi Ortiz
- Position: Aibonito
- Contact Information: (939) 243-4001

Humidity and Temperature sensor

The proporsal in mind is a integrated humidity and temperature sensor that provides high accuracy measurments for humidity levels like the amount of water vapor in the air. The humidity in industrial and home environments is critical to the long-term health and well-being of people or the up keep of the equipment of the insdustry involved. Humidity sensing and control is also important for the safety of equipment and employees. The need that creates the problem is that in theres a high humidity in Puerto Rico since its a tropical island thus this system would be very beneficial in health benefits and cost reduction by alerting the user and resolving the problem at the same time manually by an interative system. The problem adreesed is the humidity problem in warehouses and retail locations that damage documents around the place. The solution scope is the water vapor passes into a conductive electrode that water molecules in the air permeate the humidity sensing dielectric and this changes by the concentration of water and the integrated sensor measures the capatinance and coverts into digital data and also measures the temperature and outputs the information in I2C inter-integrated controller and this runs on a battery bank that also has a USB-C port to do maintenance on the software.

Who is your client? (contact information)

Rubén M. Melendez (787-447-0633)

Potential Project Description Enrique

The potential project revolves around the sport airsoft. In airsoft, there are a few modes mainly played, being team deathmatch, capture the flag and king of the hill, with a few others. While these modes are fun, the mayority of matches is team deathmatch with one life, which can become boresome after a while. Because the majority of games are like this, most people who play wouldn't think different ways to play, since it's mostly take out the enemy team. There isn't really a good sense of needing to make a stratgey to defend a zone, where the other team may come from, or how to stop them. Not only this, but these require others to become referees in order to keep count of scores. For this, a new mode can be done called "Domination", which will be achieved with the help of micro-controllers. One micro-controller will be on the arm of the user, which we'll call a player, with a screen and sensor to determine if the player is capturing a point or if the point has been captured, while another will be set in a point, with a sensor, to let the other micro-controller determine if they are close enough to the point to capture it or let know the user the point has been captured by their team. With the same setup, an easier mode can done called "Capture the headquarters", where a team must defend a point while another team tries to capture it, but the attacking team cannot start to capture as long as there is a member of the defending

team at the point. With these two modes, a better way to collect points can be made, and since the players will have screens on their wrists, they can see how much points their team is holding and let them determine what would be the next best course of action. This should be majorly used when there are airsoft events, so there are more interesting and challenging modes where players can change the way they play, how they think at the moment and also form a new plan depending on the situation.

Who is your client? Enrique

Name: Brian Medina Number: 787-402-9217

1. Insulin Temperature Warning System

    - Feasibility: It is very feasible given 4 month development cycle.
    - Has it hardware and software opportunities? It both utilizes the hardware elements within a micro-controller and the flexability and decision making capabilities of a micro-controller to a large extent whilst needing to be low cost.
    - Dependencies: The delivery of materials from component vendors.
    - Required technologies: Micro-controller, temperature sensor, memory controller, segment display, rechargeable LIPO batteries, BMS and uninterruptable power supply.
    - Cost: A rough estimate of the necesary components yielded a cost of $35.