



BIOMEDICAL ENGINEERING SENIOR DESIGN DAY

Friday, May 2, 2008

Project Demonstrations: 10 to 11 AM
Bronwell Room 213

Project Presentations: Noon to 3 PM
ITE Building, Room C80



**Biomedical Engineering Program
The University of Connecticut**

BME 291 Senior Design Projects

Project Title: Assisted Leg Holding Device for Medical Procedures (RERC)

Jennifer Bruno , Katherine Etter, Gehendra Kunwar

Team #1

Description: The device will allow medical personnel to adjust and lift the patient into the device with minimal effort via an anti-gravity mechanism. Additionally, minor adjustments will be accomplished using locking rotational devices that mimic that natural movement of the hips while repositioning the patient for optimal alignment during a given procedure.

Automatic Syringe Loading Device (RERC)

Team 2

Scott Relation, Daniel Littleton, and Kathryn Tempe

The Automatic Syringe Loading Device will assist disabled diabetes patients in accurately preparing their insulin doses. The device will use both visual and audio prompts to interact with users; keypad specified dosage amounts will be precisely loaded into syringes to within 1/1000th of a milliliter.

E-Racer (NSF)

Team 3

Kevin Arpin, Michael Marquis, Allison Meisner, Travis Ward

This project involves the modification of a go-kart for an eight year old client with cerebral palsy who has limited movement of his left arm, almost no control of his legs, and drops his head when he gets excited. A joystick will be added to the existing steering wheel control to allow for switching of acceleration, braking and steering control between the two mechanisms. In addition, several safety features will be added to the go-kart to accommodate the client's needs.

Team No.4 (NSF)

Lu Ma, Nahum Kryzman, Raj Shah

"Shampoo/Conditioner Identification Device"

A "talking" belt that outputs an audible message in response to the depression of a button. The device is customizable to fit different size bottles to help the client who has reduced vision and mild-to-moderate progressive cognitive impairment to distinguish the shampoo and conditioner in the shower.

"Backpack Lever Arm System"

A lever arm system consisted of 3 segments that brings the backpack from the back of the wheelchair to client's midline using unique rotational mechanisms in a specific sequence. The device is at a convenient folding position when at rest, and fully controlled by a switch located near client's joystick.

The Assistive Robotic Arm (NSF)

Team 5

Members: Along Dagan, Aaron Hernandez, Michael Khalil

Summary: An assistive robotic arm is being designed to aid a young child with cerebral palsy become more independent in his daily routine. The device will enable him to transform his gross motor movements into fine motor functions that are sub par due to his illness.

Team No.6 (NSF)

Derek Kulakowski, Andrew Mclean, Matthew Zywiak,

Mounted Art Instrument:

The purpose of this project is to create a device which will allow people with limited mobility to draw or paint on an easel. This will be done by building a device which will be mounted on an easel and create drawings through horizontal and vertical movements. The relative movements of the device will be controlled by the user through use of infrared sensors.

Game for Speed and Accuracy of Name Recall:

The NSF has asked for a computer game to aid people with memory disorders such as Alzheimer's and Dementia. Many of these people experience frustration and embarrassment when relatives or friends come to visit them and they can not remember their names. We will be designing a computer game which can be played by any individual while their friends or relatives are not present. The game will allow a caretaker to upload pictures of loved ones which the user can then practice naming.

Alternative Mouse Trial and Assessment System for Adaptive Computer Control:

The NSF has asked for two devices which can be used as computer inputs instead of the standard keyboard and mouse. These devices will be used to help people with upper extremity disorders which limit fine motor control of their hands and arms. Two computer games will also be created to assess speed and accuracy to determine which device is best for different users.

MEDSense: A Portable Pill Dispensing Device (RERC)

Team #7

Ashley Martin, Christopher Faulkner, Ryan Pogemiller, and Timothy Coons

MEDSense is an automated, portable pill cap that alleviates the stress of the daily medication regimen. Using a multi-modal alarm system designed for a wide variety of patients, it alerts the user when it is time to take their medication and automatically cuts and dispenses their pills.

Accessible Incontinence Control Device (RERC)

Team 8

Maroun Bousleiman, Erica Kramer, Yamalia Roberts, Zack Smith

This goal of this project is to create a device that will both control a patient's urinary incontinence and provide the user with an indication of the status of the bladder. This will be accomplished by using an implantable device that can be used by people of both sexes as well as people with disabilities.

Accessible Weight Scale for Seated Users (RERC)

Team # 9

James I. Johnson, Gregory Whitehouse, Patrick Tshilenge

An easy-to-use weight scale integrated into an elevated toilet seat, providing accurate weight measurements in both visual and audio outputs, for mobility challenged users.

The Biomedical Engineering (BME) Senior Design course is intended to engage students in a meaningful experience by bringing together concepts and principles learned in the biomedical engineering curriculum, extend this theory to practical application, then to plan and construct a finalized product.

This experience is comprehensive, reflecting all aspects of the engineering design process along industry guidelines. Problem solving for large-scale, open-ended, complex and sometimes incompletely defined systems is the primary emphasis of these courses.

Students use the web to describe and report progress on their project. Students have also utilized the web to facilitate communications with other universities in joint projects. The Senior Design homepage is located at:

<http://www.bme.uconn.edu/bme/ugrad/bmesdi-ii.htm>

Interested individuals are welcome to visit this site to experience first-hand what BME senior design is all about.

For more information regarding the BME Senior design course contact:

Dr John D. Enderle:

Phone: (860) 486-5521

E-mail: jenderle@bme.uconn.edu

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sponsors for their generous support.**

**Rehabilitation Engineering Research Center
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