Computer Science & Engineering

Senior Design Day

Friday, May 3, 2013

Gampel Pavilion

Senior Design Instructors for 2012-2013

Fall: CSE4939W Computer Science & Engineering Design Project I
Dong-Guk Shin, Ph.D. and Steven Demurjian, Ph.D.

Spring: CSE4940 Computer Science & Engineering Design Project II
Steven Demurjian, Ph.D.

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CSE Senior Design Course

CSE4939W/CSE4940 Year Long Sequence

http://www.engr.uconn.edu/~steve/Cse4939W/cse4939W.html

CSE4939W/CSE4940 Computer Science and Engineering Design Project I and II is the new year long sequence for all CSE and CS majors that began in the Fall of 2012. In CSE4939W, student teams of 4-6 members will spend ten weeks related to non-programming aspects of the two semester project, to define all of the requirements necessary to prototype the project over the remaining four weeks of the first semester and continued into the second semester with CSE4940. The intent is by the end of the first semester that all of the preparatory work has been completed and that the team is ready to go for the second semester with an emphasis on maintaining the design, delivering five prototypes, conducting testing of all types, and resulting in a system that is at least at the alpha level of completion. The project requires students to learn new technologies, e.g., iOS, Android, SensaTouch, and Titanium SDKs for mobile platforms (phones and tablets), and gaming platforms such as Cocos2D, Unity 3D, HAXE, and STEM/Valve.

Team A:

## *After* – A 2D Survival Adventure Video

After.. is a 2D top-down survival adventure video game in an open world realized as a mobile application for all iOS devices. The player's objective is to try to survive as long as possible in a dynamic reactive environment with the ability to explore, find supplies, grow food, build shelters and fight hostiles. This application will aim to provide the player with a malleable, dynamic and responsive world that they can explore and shape to their whim while also providing an interesting narrative and traditional adventure game play experience. The better a player is, the more efficiently they will use the resources around them, be able to explore and be more inclined to risk death to find resources. *After*.. is a game of survival, resource gathering, and exploring. *After*.. has been written using the Cocos2D library for iOS devices. This library was chosen because of its compatibility with the tile map standard TMX. The TMX file type has existing map editors and tile sheet support so it is an ideal candidate for this application. *After*.. is intended to be played by the large casual gamer user base already existing for the iOS community with a day and night gameplay mechanic that allows for discrete sessions of gameplay that can be picked up and played on the go.

Pictured from left to right: Michael Szahaj, Chris Magrane, James Richard, William Birtwell, and Jordan Piscitelli.

AFTER...

A TOP-DOWN 2D SURVIVAL GAME FOR iOS
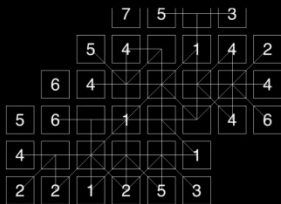
ADVANCED CUSTOM WORLD GENERATION

Easily create your own custom world! Pseudorandom creation allows you to create custom worlds that can be duplicated by other players, while still allowing enough customization to keep gameplay interesting. Our biome generation works by creating random biome points and interpolating between them. This prevents disjointed biomes. Each temperature and humidity value is mapped to a biome.
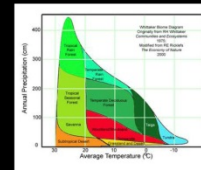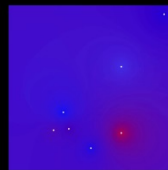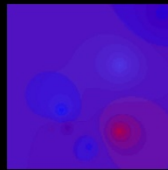
INTELLIGENT ENEMIES

Your enemy adapts to your skills resulting in more challenging gameplay. Enemies become smarter, move faster, and respond to changes in terrain over time. They freeze in colder climates and get stuck in swamps. Some zombies aren't aware of your location, but as you keep moving, they will find you.

BUILT USING COCOS2D AND BOX2D

Powerful and open-source, Cocos2D provides a strong foundation upon which our application is built and Box2D ensures realistic physics between obejcts and the environment.

COCOS2D

Made for iPhone

Made for iPad

WILLIAM BIRTWELL   CHRIS MAGRANE   JORDAN PISCITELLI   JAMES RICHARD   MICHAEL SZAHAJ

Team B:

Wings: Aerial Dog-Fighting Simulator

Wings is a video game, a flight and dog-fighting simulator, with the main client running on a personal computer. The major distinguishing feature will be that the primary means of control over a player's airplane is their smartphone by utilizing the various movement and positional sensors within the phone. The game will have three distinctive programs: the PC client, the smartphone client, and the server client communicating with both. Provided that their smartphone has a gyroscopic sensor and a touchscreen, the player will control their airplane's yaw, roll, and pitch by angling their phone in the appropriate direction. Unity 3D was chosen as the game engine since it can be deployed to Windows and Mac OS X and programmed UnityScript (a custom Unity language), C#, and Boo.
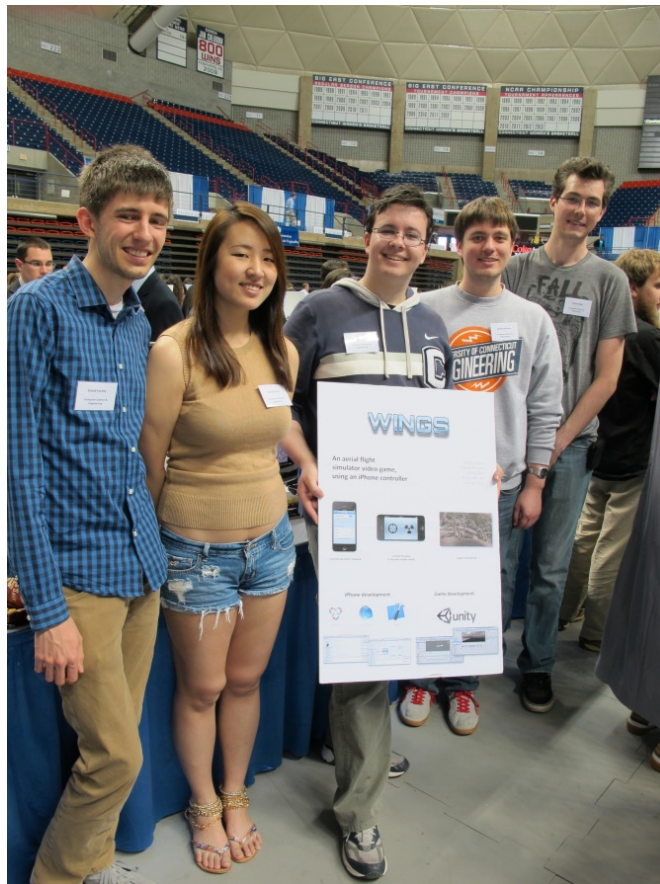
Pictured from left to right: David Furnes, Ranran Zhou, Eugene Kovalev, Kevin Johnson, and James Blair.

WINGS

**An aerial flight
simulator video game,
using an iPhone controller**

David Furnes
Eugene Kovalev
James Blair
Kevin Johnson
Ranran Zhou

Connect via a Wi-Fi network

Control the game
in the palm of your hands

Explore and destroy

iPhone development

Bonjour

Cocoa Touch

Xcode

Game development

unity

Team C:

Mobile APP: HuskyWalk Tour

Sponsor: Louis Herman of UConn UITS

The HuskyWalk application has been designed and implemented to be added on to the current my UConnapp which will allow the user to get to know the UConn campus. HuskyWalk is primarily available on the user's mobile devices, tablets, and smartphones. HuskyWalk allows the user to take a tour around campus by choosing either a preset tour, a user made tour, or a custom tour. If the user chooses to make a custom tour, the tour can later be uploaded into user made tours which will allow other users to access that tour. After choosing a tour, the application will generate a route for the user to take using Google Maps. GPS has been used to allow information (images, text, and multimedia) from the library database to be available on the mobile device; QR codes can be used on buildings and signs to pinpoint location as well. Sencha Touch is the platform being used to create an HTML5 application that can be run on various devices, mainly iOS and Android.

Pictured from left to right: Steven Wong, Robert Teeling,
Anthony Intino, Stanley Wong, and Brian Light.

Husky Walk

Computer Science & Engineering Members: Robert Teeling, Stanley Wong, Steven Wong, Anthony Intino, Brian Light
Faculty Advisors: Profs. Steven Demurjian (CS&E, Storrs), Louis Herman (UITS)

The basics:
• Guided tours for new students, visitors, or anyone else.
• Themed custom tours can be created by faculty, or anyone interested. These can be things like Engineering specific tours, music, or anything else.
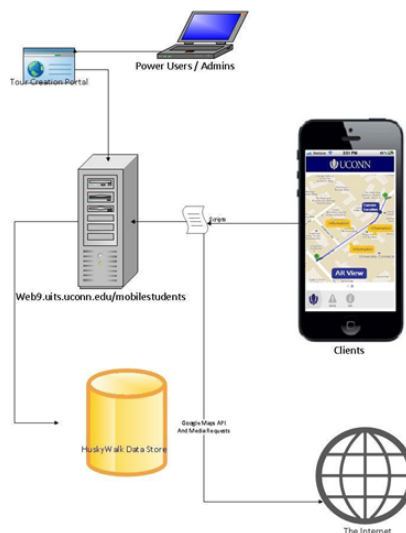
Technologies Used:

Sencha Touch Build Mobile Web Apps with HTML5

Google maps

php MySQL. ORACLE

Design Architecture:
• The Core of the Husky Walk elements are contained on a MySQL database provided by the school.
• Our tour creation website interacts with this database and can write to it.
• The mobile application will read from this database to display the tours.

Power Users / Admins
Tour Creation Portal

Web9.uits.uconn.edu/mobilestudents

HuskyWalk Data Store

Google Maps API And Media Requests

Clients

The Internet

MyUconn:
• Official mobile application of Uconn, many features such as live bus tracking, dining hall menus, school directories and soon a guided tour of campus.
• HTML 5 technology allows the app to be accessed easily from almost any mobile device.

Team D:

Rooms – A Multiplayer Real-time Game

ROOMS is a 2D, top-down, massively multiplayer (MMO) online game that can be played in the web-browser (Google Chrome) as well as on iPhone and Android mobile devices. Depending on whether the game is run on a personal computer or a mobile phone, the interfaces and controls vary. Smartphone controls are implemented through the touch screen and there is only access to the core game and account creation. In the browser version of ROOMS, the in-game controls are mouse-based and users have access to all features of the website, including the editor and account management. ROOMS consists of an infinite number of levels with doors and filled with other content-items, monsters, containers or other players. A player may interact with the content of the room and then exit through one of the doors. The interactions include: using and collecting items, fighting monsters and player-player interaction.
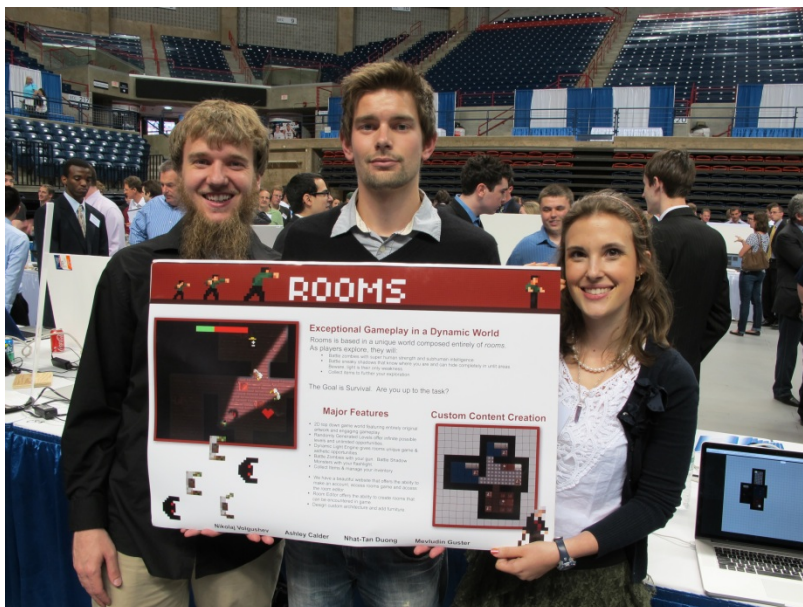
Pictured from left to right: Mevludin Guster, Nikolaj Volgushev, and Ashley Calder. Nhat-Tan Duong (not pictured).

ROOMS

Exceptional Gameplay in a Dynamic World

Rooms is based in a unique world composed entirely of *rooms*.
As players explore, they will:

- Battle zombies with super human strength and subhuman intelligence.
- Battle sneaky shadows that know where you are and can hide completely in unlit areas. Beware, light is their only weakness.
- Collect items to further your exploration.

The Goal is Survival. Are you up to the task?

Major Features

- 2D top down game world featuring entirely original artwork and engaging gameplay.
- Randomly Generated Levels offer infinite possible levels and unlimited opportunities.
- Dynamic Light Engine gives rooms unique game & asthetic opportunities.
- Battle Zombies with your gun. Battle Shadow Monsters with your flashlight.
- Collect Items & manage your inventory

- We have a beautiful website that offers the ability to make an account, access rooms game and access the room editor.
- Room Editor offers the ability to create rooms that can be encountered in game.
- Design custom architecture and add furniture.

Custom Content Creation

Nikolaj Volgushev   Ashley Calder   Nhat-Tan Duong   Mevludin Guster
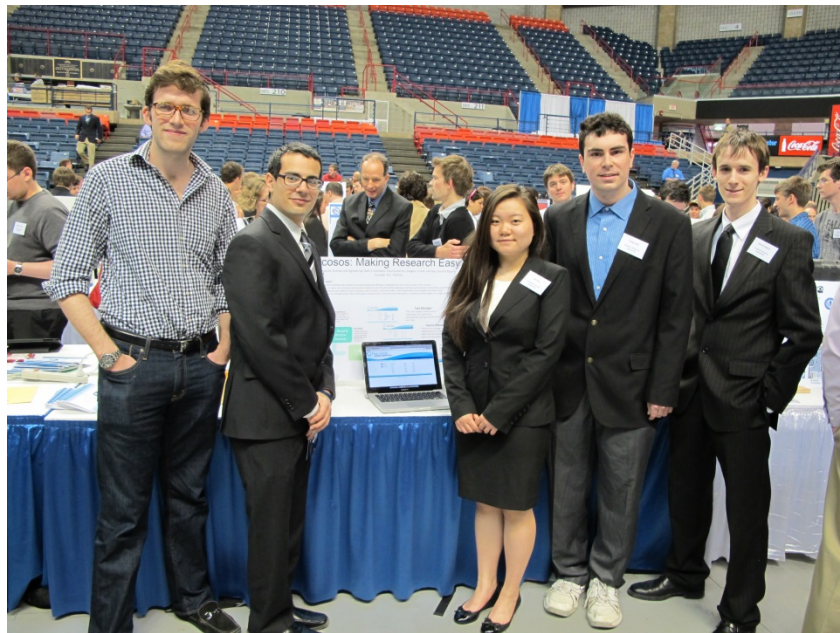
Team E:

Focosos Collab Research Tool

Sponsor: R.C. Thornton of Focosos, LLC

Focosos is a proof of concept website designed to help individuals writing and collaborating on a research paper. From beginning to search for sources to citing them when the paper is complete, Focosos is designed to help guide the user through every step of the process. The site is intended for both students and professionals who struggle with the process of developing a well-organized research paper. Projects can be created with team members and contain documents that can be annotated by users as part of a process of collaboratively working towards a common goal. The main user interface has a navigation bar with: a Project Dashboard, a Project Planner, aSource Management, Documents, and Collaboration Board screens. Annotations can be added to PDF documents and collected and organized to generate a report. The front-end web-based interface uses HTML, CSS, and Javascript; overall, Focosos utilizes a LAMP architecture (Linux operating system, the Apache Server, MySQL, and PHP).
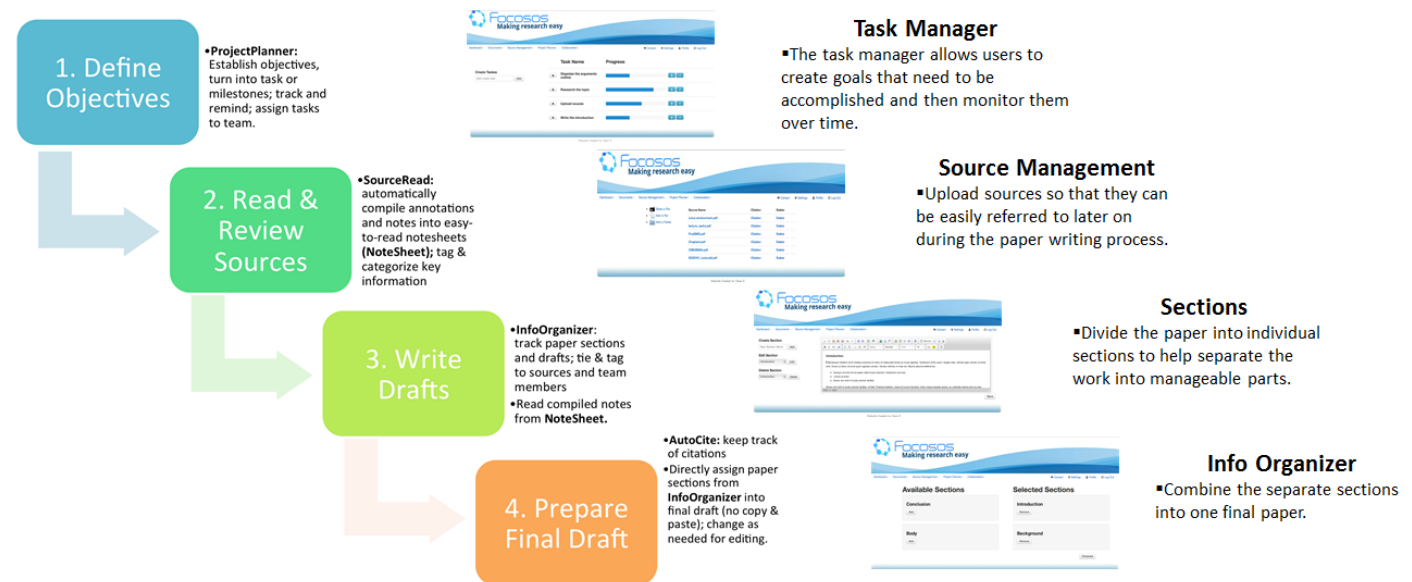

Pictured from left to right:
R.C. Thornton, Paul Gutierrez, Jiali Gao, Greg Frank, and Garrett Bajorin.

Focosos: Making Research Easy

Computer Science and Eginiering Team E members: Paul Gutierrez, Gregory, Frank, Jiali Gao, Garrett Bajorin
Founder: R.C. Thorton

What is Focosos?

- A website designed to facilitate the creation of research papers by offering a comprehensive set of tools to aid in their creation.
- Focosos consists of a sleek user interface implemented using html and CSS with Twitter Bootstrap, and back end database functionality using PHP and MySQL
- Focosos is contains many different tools including a pdf annotator, online text editor, citation generator, task manager, and many others.
- Focosos allows users to complete every step of the paper writing process, from brainstorming topics to compiling the final paper, on a single centralized hub.


1. Define Objectives

- **ProjectPlanner:** Establish objectives, turn into task or milestones; track and remind; assign tasks to team.

2. Read & Review Sources

- **SourceRead:** automatically compile annotations and notes into easy-to-read notesheets **(NoteSheet);** tag & categorize key information

3. Write Drafts

- **InfoOrganizer:** track paper sections and drafts; tie & tag to sources and team members
- Read compiled notes from **NoteSheet.**

4. Prepare Final Draft

- **AutoCite:** keep track of citations
- Directly assign paper sections from **InfoOrganizer** into final draft (no copy & paste); change as needed for editing.

Task Manager

- The task manager allows users to create goals that need to be accomplished and then monitor them over time.

Source Management

- Upload sources so that they can be easily referred to later on during the paper writing process.

Sections

- Divide the paper into individual sections to help separate the work into manageable parts.

Info Organizer

- Combine the separate sections into one final paper.

Team F:

UConn-Ocalypse Multiplayer 2D Adventure Game

The UConn-Ocalypse video game will be based off of UConn for entertainment after an unknown apocalyptic event occurs and will be available for use on personal computers and possibly tablet PC's as well. Players will navigate an accurate map of UConn Storrs which will be recognizable to UConn students and allow people interested in UConn to learn the layout of the campus. A real-time battle system allows users to fight with a variety of enemies based on the apocalyptic UConn environment. There are individual instances of the game running simultaneously at different difficulty levels with small groups of online users to accommodate a variety of player skill levels. The multiple difficulty levels will allow users to enjoy playing the game at a difficulty that will still provide a challenge to even the skilled players of the game, while simultaneously providing replay value to people who have previously completed and enjoyed the game. Game leaders will be able to kick players and control difficulty. The game is browser based utilizing HTML5 and Javascript on the client side and MySQL to store player data and keep track of access control.
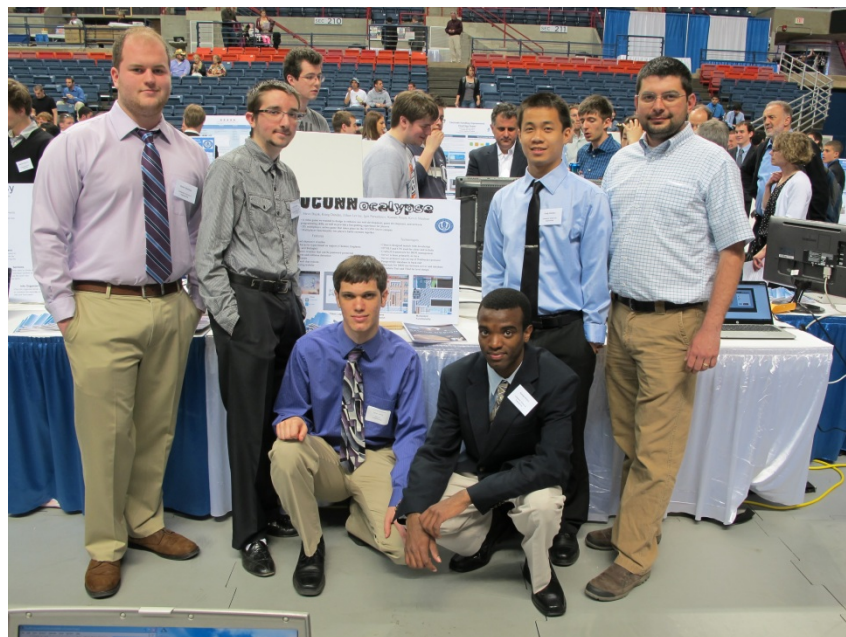
Pictured from left to right: Kevin Sheehan, Steve Bujak, Ethan Levine, Kamau Peters, Kraig Dandan, and Igor Parsadanov.

Uconnocalypse

Steve Bujak, Kraig Dandan, Ethan Levine, Igor Parsadanov, Kamau Peters, Kevin Sheehan

• A video game we wanted to design to enhance our web development, game development, and network programming skills, as well as provide a fun gaming experience for players
• 2D, multiplayer, action game that takes place on the UCONN Storrs campus
• Multiplayer functionality lets players battle enemies together

Features

• Account and character creation
• Multiple character types based on majors (Chemist, Engineer, Philosopher, and Biologist)
• Game instance creation that can be password protected
• 2D movement and collision detection
• Battling enemies
• Inventory and chat system
• Accompanying website

Technologies

• Client is designed mainly with JavaScript
• HTML5 and CSS used for client and website
• CraftyJS framework for DOM management
• Server is done primarily in Java
• Server protocol runs on top of WebSocket protocol
• PostgresSQL database in back end
• DB Admin Tool for level design

Client Login Page


Client Game Selection

Game Layout

Multiplayer Functionality

Team G:

Mobile Medication Management Application

The Personal Health Assistant (PHA) Mobile Medical Management Application is a mobile application for both iOS and Android devices that allows the individual users to manage different aspects of their health, with a focus on managing medications. The goal of the project was to expand PHA to include data about disease management including diabetes, obesity, asthma, and chronic heart failure. This data can include diet, exercise, blood sugar levels, BP, pulse, etc. The data entry capability by patients will be augmented with the ability to deliver advance warning to healthcare providers of potential threats in patient health by using advanced algorithms to detect potential health threats for the four diseases, and to automatically notify providers via decision support algorithms for analyzing data associated with diseases. The application is also capable of helping patients to manage their medication intake and alert the patient to take certain medication. PHA has been coded with the Titanium framework that allows one code base to generate apps in iOS, Andriod, Web-based, etc. PHA interacts with a MySQL database and the Microsoft HealthVault Personal Health Record.
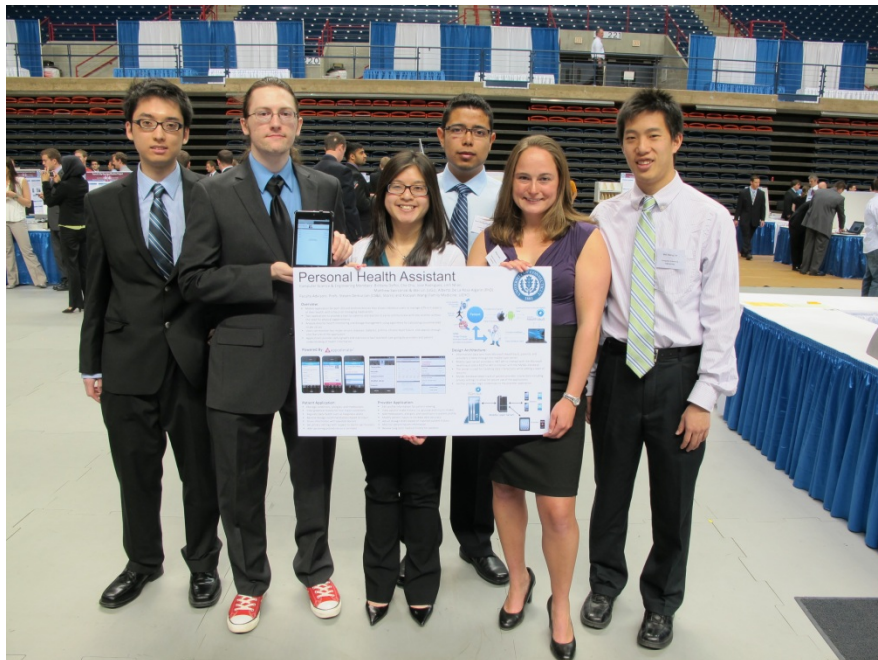
Pictured from left to right: Che-Cheng Chu, Matthew Swircenski, Linh Nhan, Jose Ronquillo Rodriguez, Brittany DePoi, and Wei Cheng Lin.
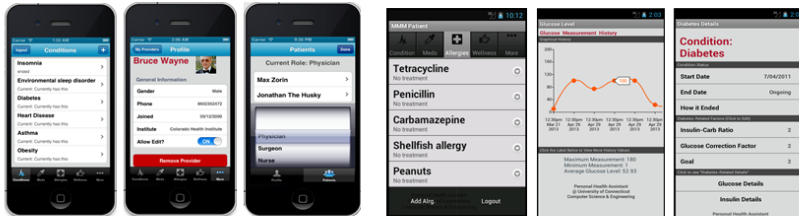
Personal Health Assistant

Computer Science & Engineering Members: Brittany Depoi, Che Chu, Jose Rodriguez, Linh Nhan,
Matthew Swircenski & Wei Lin (UGs), Alberto De La Rosa Algarin (PhD)
Faculty Advisors: Profs. Steven Demurjian (CS&E, Storrs) and Xiaoyan Wang (Family Medicine, UCHC)

Overview:

- Mobile application for both iOS and Android devices that allows individual users to manage different aspects of their health, with a focus on managing medications
- Two applications to provide a tool for patients and doctors to easily communicate with one another without the need for physical appointments
- Analyze data for health monitoring and dosage management using algorithms for calculating recommended intake values
- Users can monitor four major chronic diseases: diabetes, asthma, chronic heart failure, and obesity through core features of the application
- Applications provide useful graphs and statistics to facilitate both care giving by providers and patient understanding of health information

Powered By: appcelerator

Design Architecture:

- Information/ data sent from Microsoft HealthVault, patients, and providers is done through the middle layer server
- Middle layer server provides a .NET API to interact with the Microsoft Healthvault and a RESTful API to interact with the MySQL database
- The server is used for handling data interactions while adding a layer of security
- MySQL database keeps track of patient-provider interactions including privacy settings to allow for secure use of the applications
- Verifies provider login credentials to the provider application
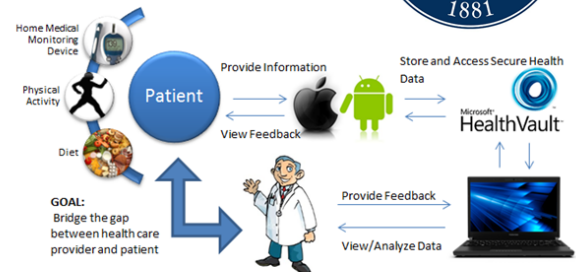

Patient Application:

- Manage conditions, allergies, and medications
- View graphical history for four major conditions
- Regulate daily health such as happiness levels
- Receive dosage recommendations based on input
- Share information with selected doctors
- Set privacy settings with respect to doctor permissions
- Add upcoming procedures as a reminder

Provider Application:

- Edit profile information for patient viewing
- View patient intake history (i.e. glucose and insulin intake)
- Add medications, allergies, and conditions to patient profile
- Modify patient inputs to increase data accuracy
- Adjust dosage levels based on inputted patient history
- Monitor patient health information
- Review long term medical history for patients