

## *Student Research Projects Supervised*

- **Wideband Binary Phase Shift Keying (BPSK) Receiver Project** (Fall 07)

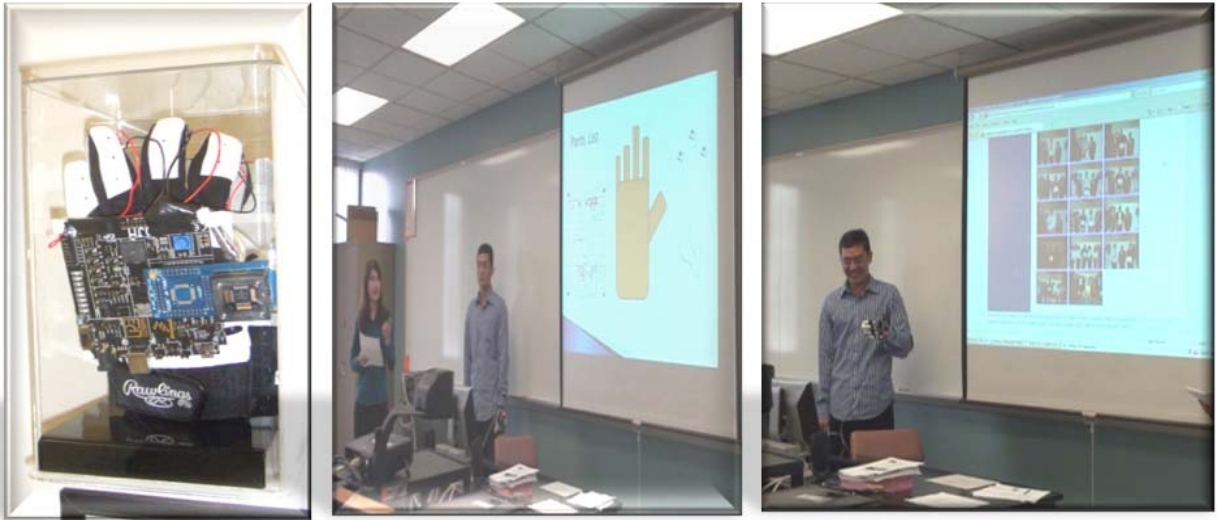
Student involved : Hao-Sheng Wu

Brief overview : The project combines BPSK, a very efficient form of data modulation with wideband capability of a receiver, thus achieving very high data transfer rate.

- **Glove Mouse Project** (Fall 07, Spring 08)

Students involved : Hao-Sheng Wu, Maza Eshak, Minh Trang, and Nikki Ahmadi

Brief overview : The goal of this project is to build a computer mouse in the form of a glove which translates various hand movements into cursor movements.



- **Chip Implementation of Ultrasound Digital Beamformer for Array Transducers**  
(Spring 09, Fall 09)

Students involved : Julie Acosta, Patrick Lefler and Blair Tadeus

Brief overview : High-frequency (>20 MHz) ultrasound transducers which has been successfully applied to ophthalmology, dermatology, and intravascular imaging is investigated for chip implementation.

- **FPGA Implementation of SigmaRho Kalman Filter** (Spring 09, Fall 09)

Students involved : Ernie Bell and Daniel Samarin

Brief overview : High-performance high-speed algorithm like SigmaRho adaptation of Kalman filter is investigated for chip implementation.

- **Design Flow Development in Promising Nanotechnologies** (Spring 09)

Students involved : Julie Acosta

Brief overview : Study and design flow development in three promising Nanotechnologies

- Solar powered “Smart” Dog House (Fall 08, Spring 09)

Students involved : Julie Acosta, Thew Chieng, Kenneth Ly and Ian Steed

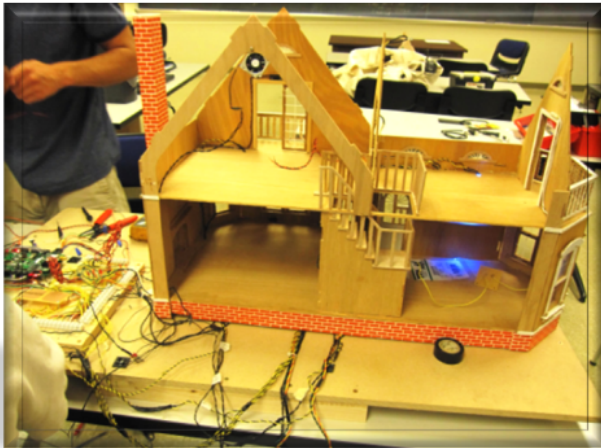
Brief overview : The house incorporates several automated features in order to provide the pet means to have a healthy life. The main premise for the house is to care for the pet when the owner is unavailable or away.



- **“Smart” Home Project (Fall 08, Spring 09)**

Students involved : Ernie Bell, Sergio Cardoso, Patrick Lefler, Gustavo Bolanos and Ernie Rodriguez

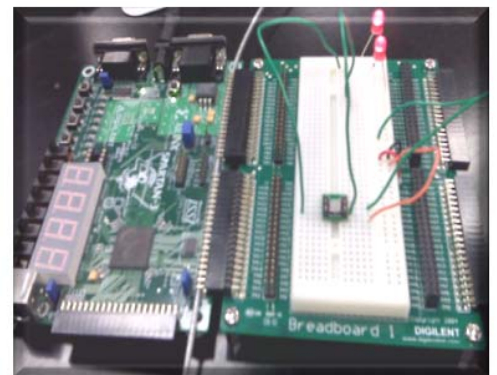
Brief overview : “Smart” home controls various aspects throughout the home such as the convenience of controlling the temperature, ability to turn on coffee makers in the morning and allowing blinds to open and close providing natural light to enter the home.



- **SmartSleep Alarm System Project (Summer 09)**

Students involved : Lisa Slaughter, and Gerardo Lizarraga (Cypress Community College - STEM summer research)

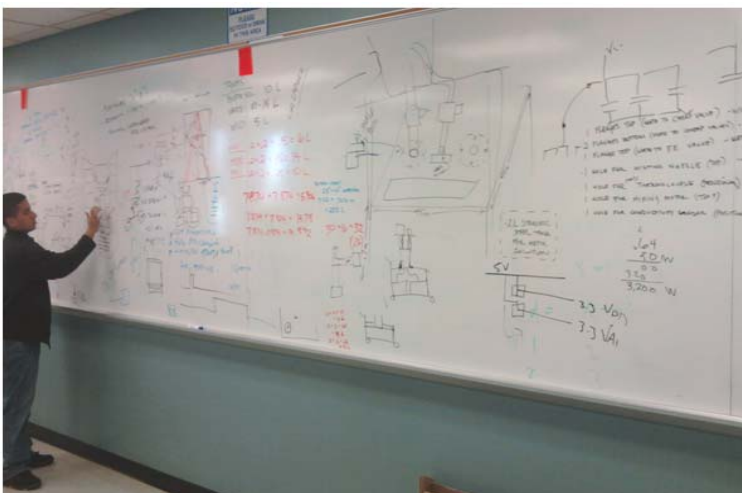
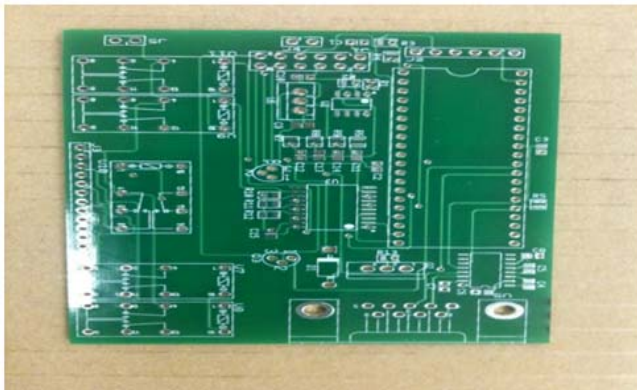
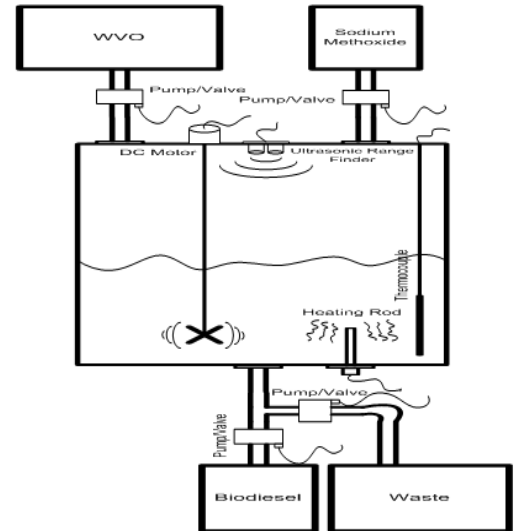
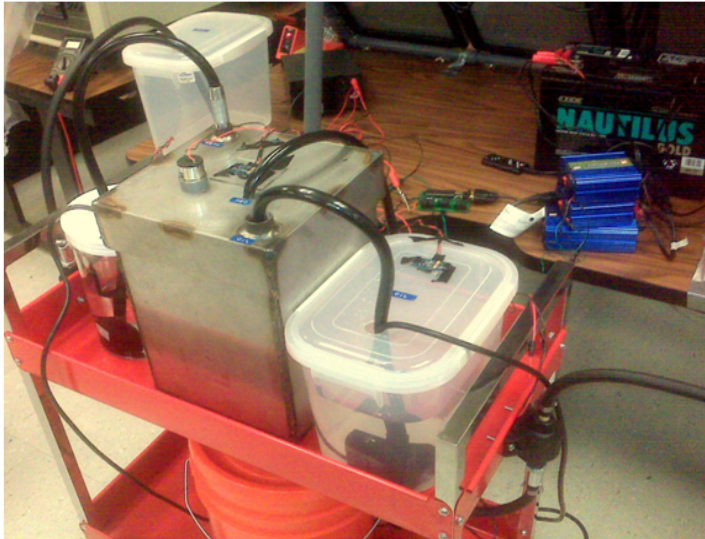
Brief overview : Smart alarm clock measures the sleep cycle, and waits for one to be in the lightest phase of sleep before rousing.



- **Fully Automated Solar-Powered Biodiesel Processor (Fall 09, Spring 10)**

Students involved : Daniel Samarin, Marlon Amaya, Abdussalam Aburwein, Blair Tadeus and Rawad Hilal

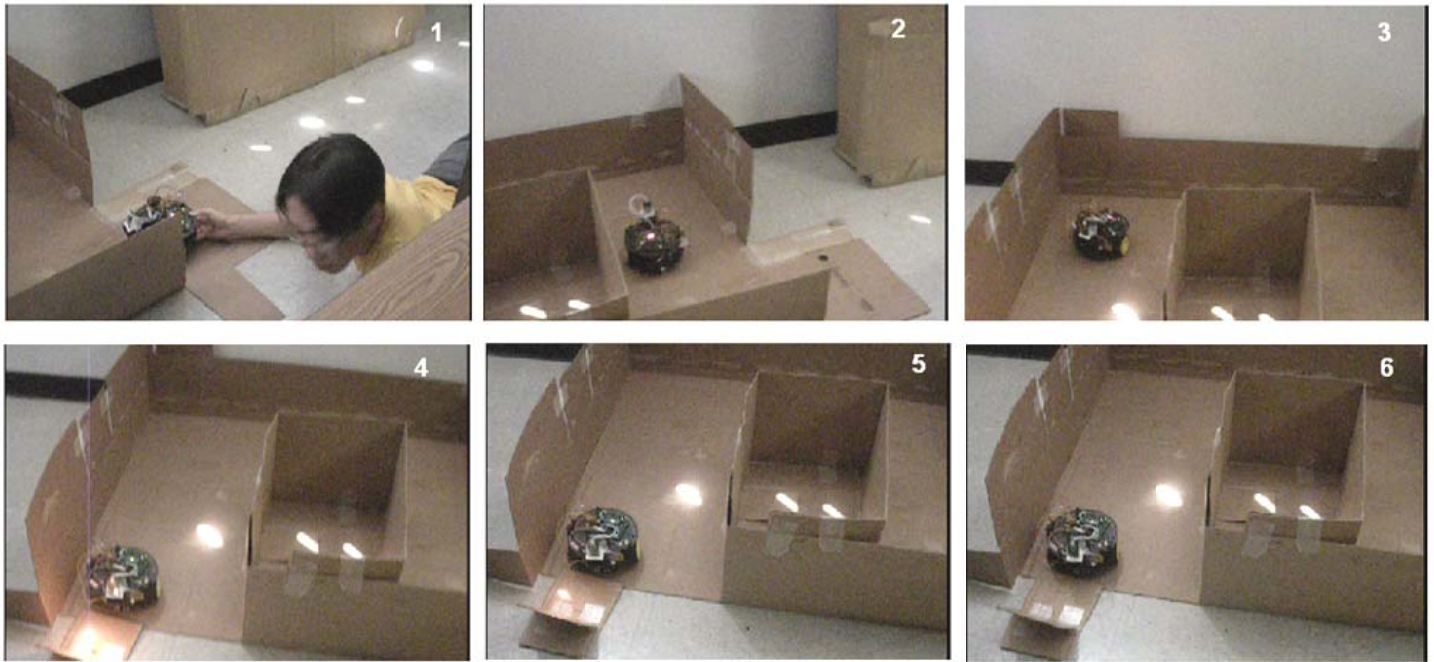
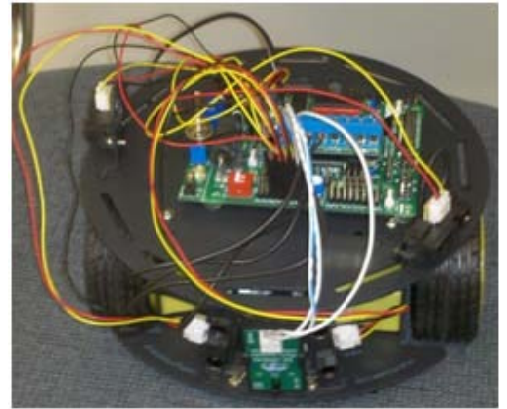
Brief overview : The objective of the proposed research is to design and implement a solar-powered fully automated processor that produces biodiesel from waste vegetable oil (WVO), readily available from fast-food restaurants on campus.



- **Fire Fighting Robot (Summer 10)**

Students involved : Garret Diulio and Jason Lee (Cypress Community College - STEM summer research)

Brief overview : An algorithm for a fire fighting robot that can traverse through a maze towards the fire source was developed and the prototype was implemented on a microcontroller board.



- **Local DNA Sequence Alignment on FPGA (Summer 10)**

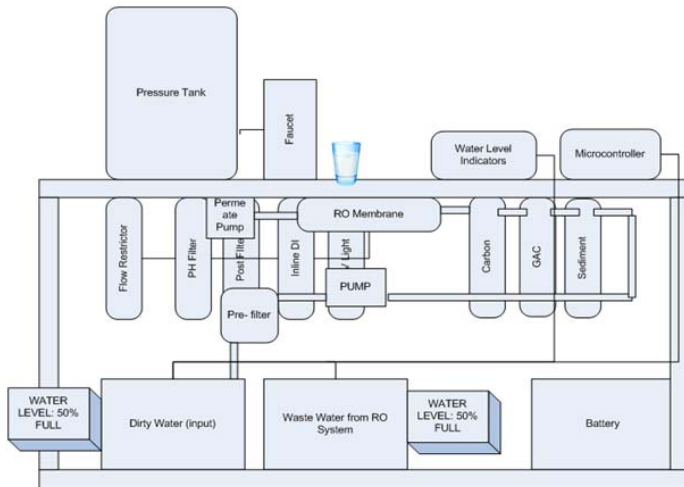
Students involved : Jainam Shah (Cypress Community College - STEM summer research)

Brief overview : DNA sequence algorithm was implemented on a Virtex-5 FPGA chip interfaced with on-board peripheral modules. The algorithm was iteratively optimized with design constrains such as area (LUT usage) and speed.

- **Fully Automated Solar-Powered Water Purification System - A Sustainable Water Solution**  
(Fall 10, Spring 11)

Students involved : Jessica Cabrera, Alexis Karlo Maglonso, Michael Stupecky and John Tran

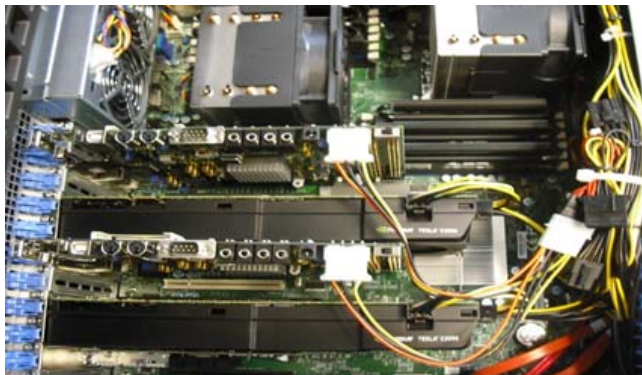
Brief overview : The objective of the project is to design and implement a solar-powered fully automated water purification system that is cost-effective, easy to use, and portable.



- **Hybrid, High-performance Cluster Computer Setup** (Fall 10, Spring 11)

Students involved : Brian Norris, Jason Luu, Joey Portillo, and Sindhu Appukuttan

Brief overview : The objective of the project is to build a supercomputing system comprising of 8 computing nodes, each with GPUs and FPGAs with Infiniband fabric as the communication backplane.



- **Logic Design on QCA Technology (Summer 11)**

Students involved : Eddie Garcia and Faustino Frias (Cypress Community College)

Brief overview : Design and implementation of arithmetic structures in Quantum-dot cellular automaton (QCA) logic, a new and promising nano-electronic technology.

