

DYMAX ENGINEERING: CAUGHT IN THE DARK RELAY TRIP WARNING SYSTEM

In the power industry, there are literally hundreds of thousands of electro-mechanical protective relays protecting transmission circuits, distribution circuits, substations and generation stations. In a generation plant, there may be as many as twenty or more relays protecting a single generator and its prime mover.

There is a problem when a relay trips and there is a significant time delay between that trip and the operator's detecting the trip. The purpose of this project is to develop a reliable but inexpensive method whereby a change in state of an individual relay can be sensed, then that change of state be sent to a computer and be rapidly reported to the operator.

Adding a current probe sensor to the relay will allow information about the relay to be sent to a computer. This upgrade is very useful in the power industry. This low-cost solution avoids time-consuming modifications to existing relays being used in the field. The information will be processed with a PIC microcontroller and output to a GUI.

<http://www.egr.msu.edu/classes/ece480/goodman/fall/group10/>



M. Wesley
Electrical Egr

K. Proctor
Electrical Egr

E. Kubacki
Computer Egr



M. Seal
Electrical Egr

J. McCann
Electrical Egr



Project Sponsor
Dymax Engineering

Sponsor Representative
Mr. Glenn Keates

Faculty Facilitator
Prof. Andrew Mason

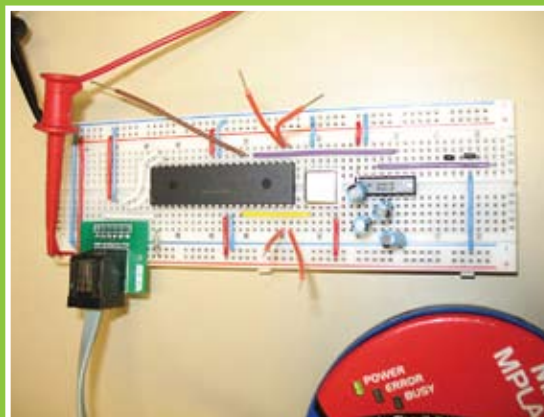
Team Members and Non-technical Roles
Matt Wesley
Manager

Eric Kubacki
Webmaster

Mark Seal
Documentation Prep

Kyle Proctor
Presentation Prep

Jerry McCann
Lab Coordinator



Mr. Keates



Prof. Mason



A SHELL OIL COMPANY CHILDREN'S HUMANITARIAN PROJECT: FLOOR HOCKEY WALKER FOR JOSEPH WISE

Joseph Wise is an 11-year-old boy who has Cerebral Palsy. This neurological disorder is caused by abnormalities in parts of the brain that permanently affect body and muscle movement. While this situation could hinder an individual's will to be active, Joe makes it a point to partake in numerous activities. Throughout the course of his childhood, Joe has found a love for the sport of hockey. Although Cerebral Palsy has limited the use of his legs, he is determined not to let the current design flaws in his walker affect his ability to participate in floor hockey.

Currently, the walker that Joe uses for floor hockey does not stand up to the rigors of the game. The main issue affecting his participation is that the handles have a tendency to fall off and they are positioned too far forward, promoting unhealthy posture. Other major flaws in the current walker include wheels coming loose during everyday activity and plastic hinges breaking. In addition, the fasteners are insufficient and the walker does not collapse to a desirable size.

The main objective was to create a walker for Joe that would withstand the game of floor hockey and be functional for everyday activities. Successful completion of this project would allow Joe to play floor hockey at a higher level. Due to the open-ended nature of this project, there were numerous possibilities discussed. Upon analysis of the possibilities, an optimal design was chosen and pursued.

...*The Joseph Wise Humanitarian Design Team*



Joseph Wise

I am very excited about my new walker because it will make it easier for me to play floor hockey and control the puck. I hope it can help me get through the snow in the winter time. I am excited about not having to worry about tipping over. It will be fun to be able to keep up with the other kids and get around better on the playground when I go outside at recess. GO STATE!

- Joseph Wise



Prof. Haddow

Project Sponsors
Shell Oil Company
Houston, Texas

Professional Advisor
Mr. Joseph Wise

Faculty Advisor
Prof. Alan Haddow

Team Members and Home Towns
Patrick Eathorne
New Hudson, Michigan

Brandon Goad
Birmingham, Michigan

Patrick Grondin
Milford, Michigan

Mike MacCallum
Birmingham, Michigan

Josh Maniago
Rochester, Michigan

THE MOTOROLA YOUTH IN ENERGY AND ENVIRONMENT HUMANITARIAN PROJECT: SOLAR HEATED WORM COMPOST BIN FOR WOODCREEK ELEMENTARY SCHOOL

Urban Options is a non-profit community agency that provides energy and environmental information and services. The main purpose of the organization is to improve the environmental quality of Urban Spaces. This goal is achieved by educational programs, as well as home and yard improvement demonstrations.

Woodcreek Magnet Elementary School is one of four elementary schools participating in an outside worm compost bin program. As a Magnet Elementary School, the curriculum focus is math, science, and technology. Teachers consistently incorporate hands-on materials and activities to help students grasp technical concepts. This project is a complementary addition and key component to the fifth grade curriculum at Woodcreek.

During the warm months of the year the worms consume the lunch waste and produce compost. Worm composting is a beneficial process because it reduces the amount of natural waste that would otherwise be put into a landfill. Throughout the winter months, however, the worms become inactive and composting ceases. The designed system utilizes solar energy to warm the compost bin during the winter months, allowing the worms to continue their function.

An essential aspect of this project was to engage the fifth grade class in the design process. Students were involved in the development, design, and construction of the system. Several topics were presented to the class during the semester such as: basics of energy, solar energy, the engineering

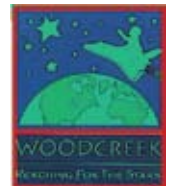


design method and the engineering profession. A website was also created to facilitate effective communication between all parties involved.

The intent of this project was to provide Woodcreek students with valuable exposure to alternative energy in order to establish young leaders with an extensive knowledge of sustainability. It is anticipated that this revolutionary solar powered worm compost bin will be duplicated at other elementary schools around the country. Urban Options, Woodcreek Elementary and Michigan State University hope that this project will serve as a step towards a sustainable future. ...Urban Options/Woodcreek Elementary Student Design Team



MOTOROLA



Project Sponsor

Urban Options

East Lansing, Michigan

Woodcreek Elementary

East Lansing, Michigan

Professional Advisors

Mr. Jim Meyerle

Ms. Diane Graham

Ms. Sandy Raymer

Faculty Advisor

Prof. Craig Somerton

Team Members and Home Towns

Caitlen Douthitt

Plymouth, Michigan

Jillian Joliat

Troy, Michigan

Matt Langenderfer

Temperance, Michigan

Brad Wackerle

Pinconning, Michigan

All team members are co-creating what we believe will be the first solar powered worm bin in the world! Not only will the solar heated bin help the red worms continue to consume organic material during the cold Michigan winters but the carefully designed system which has emphasized simplicity but effectiveness could be easily duplicated at other school sites in the U.S. and Canada.

-Jim Meyerle, Education Program Director, Urban Options

Our fifth grade class has made a tremendous shift from traditional teacher instruction to collaborative learning. The Solar Worm Bin Project has given our fifth graders the opportunity to think and work alongside 'real' engineers. This project has captured the imagination and interest of our fifth graders by actively involving them in the design process. It's a positive experience that builds not only their understanding of the elements of engineering but gives them practice in teamwork and helps them to see that they indeed can work together to find solutions to help our environment.

-Diane Graham, Teacher, Woodcreek Elementary School



Mr. Meyerle



Ms. Graham



Ms. Raymer



Prof. Somerton

SHENGLONG AMERICA: PUMP TEST STAND WITH REGENERATIVE HYDRAULIC POWER

Shenglong America is one of many subsidiary companies of Ningbo Shenglong Group; a Chinese based manufacturing company formed in 1996. Ningbo Shenglong Group is contracted by both Chinese and American companies predominantly for automotive components with some affiliation in aluminum-alloy casting machines, air-conditioning units, and pneumatic tools. All of Ningbo Shenglong Group subsidiaries take great pride in providing products and services that meet and exceed their customer's expectations.

A provider of engine oil pumps; Shenglong America has been sourced to build an automatic transmission pump. This pump is an OEM of heavy duty transmission; available in 2011. Tim Droste, the technical manager, has delegated the test stand design and construction to Petra Technologies and Sector Engineering, Inc. These companies provide expertise in hydraulic and electrical controls.

To reduce development costs, the Shenglong America Student Design Team was given the job of designing a regenerative hydraulic circuit for use in the test stand. The circuit will provide proper testing conditions while minimizing project costs. The regenerative hydraulic circuit uses energy provided by the PTO to aid a 30 hp motor; which drives the automatic transmission pump. This creates the same amount of torque that a conventional direct drive 125 hp motor would provide; thus substantially decreasing project costs. Hydrasoft's HYSAN -hydraulic simulation software- was used to perform transient and steady state analysis of power flow and pressure fluctuations. Transient analysis was referred to throughout the design process in order to reduce iterative prototyping costs. The estimated costs savings to Shenglong America amount to \$30,000-\$40,000 per test stand.

...The Shenglong America Student Design Team



Mr. Droste



Prof. Engeda

Automatic transmissions use hydraulic pumps to complete comprehensive sets of DV tests. Most DV test stands are designed to power 5-20 hp pumps. The MSU student design team will increase the power of the effective test stand to allow it to perform a DV test of a 125 hp PTO. The team must make all changes to the test stand at a minimum cost and without making significant changes to the test stand's hydraulic, pneumatic or electrical systems. No change shall be made to the electric power supply, or the shop floor "footprint" of the existing test stand area. Along with initial cost savings, the SAE J2311 compliant test stand will provide applications for future DV tests with different design specifications.

Timothy Droste
Technical Manager
Shenglong America

Project Sponsor Shenglong America

Division of :
Ningbo Shenglong Group
Ningbo, China

Professional Advisor Mr. Timothy Droste

Faculty Advisor Prof. Abraham Engeda

Team Members and Home Towns

Adam J. Brzycki
Olivet, Michigan

Laura B. Daly
Troy, Michigan

Kevin M. Miller
Charlotte, Michigan

Alison K. Solomon
Kentwood, Michigan

MOTOROLA: DESIGN AND DEVELOPMENT OF A NEW SLIDER MECHANISM FOR CELL PHONES

Motorola was originally called Galvin Manufacturing Corporation when it was founded by Paul and Joseph Galvin in 1928. However, in 1947 the name was changed to *Motorola* as the company's primary focus was on developing electronics for automotive applications. Today, *Motorola* manufactures a wide range of products that include microprocessors, satellite systems, and modems. One of the largest markets that *Motorola* has been able to tap into is the cellular phone industry after introducing the first cellular phone device in 1983.

There are three major categories that cell phones tend to fall into: candy bar, flip phones, or slider phones. *Motorola* currently offers several varieties of candy bar and flip phones but only has a few slider phones available in the market. Typically, most slider mechanisms used in the phones are very much the same in terms of their design and this leads to limited variation.

The main goal of this project was to develop a “new and unique” slider mechanism for cellular phones with a focus on improved performance that includes greater smoothness, a reduced dead zone, a relocated transition point and better reliability.

...*The Motorola Student Design Team*



MOTOROLA

Project Sponsor
Motorola
Libertyville, Illinois

Professional Advisor
Mr. Jason Wojack

Faculty Advisor
Prof. Eann Patterson

Team Members and Home Towns
Bryan Cooper
Okemos, Michigan

Julie Crane
Clarkston, Michigan

Michael Hundt
DeWitt, Michigan

Uday Mathur
New Delhi, India

The development of a new and improved slider mechanism aligns with *Motorola's* ambition to develop compelling mobile devices that allow consumers to be more productive. The goal of this project will be to create a new paradigm for how a mobile phone slider is designed.

-Jason Wojack
Principle Staff Mechanical Engineer
Motorola



Mr. Wojack



Prof. Patterson

WHIRLPOOL: ECO-EFFICENCY LAUNDRY APPLIANCES

Whirlpool is a well-known manufacturer of appliances used throughout the home. This Fortune 500 company, founded in St. Joseph, Michigan, continues to lead the market in the fabric care industry. Since their initial development, they now have expanded their production and have become a globally recognized brand. Whirlpool's main goal in this eco-efficiency project is to continue innovation in their products to further reduce energy costs and water usage for the customer's home.

Recent government encouragement and increased consumer concern for the environment drives the need for a high efficiency laundry cycle. Clothes dryers can account for a large portion of energy consumed in the laundry cycle and offer a great deal of room for efficiency gain. Improving the efficiency of this appliance can ultimately save consumers money and reduce their impact on the environment.

This project explored technology to minimize the energy consumed by a dryer by up to 75 percent. Research was aimed toward reusing and reducing the heat from the exhaust air or eliminating the exhaust completely. Other areas of investigation involved microwave drying and heat pumps.

Designs were explored, tested, and compared in order to derive the best energy-saving solution. Research into each of the possible designs was conducted by exploring current products, technical publications, and related research projects. Designs were compared using thermodynamic and heat transfer modeling to determine an optimal design. The final solution will be pursued and prototyped by a team in the coming semester.

...The Whirlpool Student Design Team



Ms. Martin

Water and energy efficiency are quickly emerging as top drivers for consumer value. In order to maintain competitive advantage and support the needs of consumers, Whirlpool is looking to develop innovative products that apply new technologies and design to the washer and dryer for drastically improved water and energy efficiency.

-Julie Martin, Whirlpool Corporation



Prof. Bénard

Project Sponsor
Whirlpool Corporation
Benton Harbor, Michigan

Professional Advisor
Ms. Julie Martin

Faculty Advisor
Prof. Andre Bénard

Team Members and Home Towns
Daniel Cassar
Waterford, Michigan

Brandon Gulker
Holland, Michigan

Justin McIver
Stevensville, Michigan

Greg Schafer
Adrian, Michigan

THE APPROPRIATE TECHNOLOGY DESIGN COLLABORATIVE: VACCINE COOLING FOR REMOTE REGION

Over two billion people live without access to electricity. Another billion live with unreliable power in squatter settlements. Much of rural Africa, Asia, and Latin America live so far from power that refrigeration is the limiting factor in the distribution of medical supplies. Conditions are not improving. In Africa, the population is increasing faster than rural electrification.

Vaccines must be kept cold to maintain their potency. Vaccinations in rural areas depend on time limited technologies such as ice, dry ice, and cold storage boxes. As a result, 50% of rural vaccines are wasted through spoilage due to lack of cooling. Public health suffers as a quarter of all children born every year—34 million infants—are not protected against diseases for which there are inexpensive vaccines and an estimated 2.1 million people around the world die every year of diseases preventable by common vaccines. (WHO 2005)

The goal of this project is to design and fabricate an inexpensive appropriate technology freezing chamber that can be made primarily from locally available resources in rural Africa and Asia. The purpose of this design is to produce ice so that vaccines can be maintained at the proper temperature of between 2°C and 8°C. This design should not rely on grid connected power. All other technologies should be considered, however the simpler the technology the better.

The final design will be licensed through Creative Commons. The Appropriate Technology Design Collaborative is actively seeking funding to produce demonstration prototypes in Africa. Mr. Souleymane Kone of The World Health Organization, Department of Immunization, Vaccines and Biologicals will be reviewing and commenting on this project.

...*The Appropriate Technology Design Collaborative Student Design Team*



The Appropriate Technology Design Collaborative

Project Sponsor
The Appropriate Technology Design Collaborative
Ann Arbor, Michigan

Professional Advisor
Mr. John Barrie

Faculty Advisor
Prof. Brian Thompson

Team Members and Home Towns
Andy Coleman
Lansing, Michigan

Alan Katz
Okemos, Michigan

Lindsay Kredon
Sterling Heights, Michigan

Jessica Theis
St. Johns, Michigan

Extending the shelf life of vaccines through the design and prototyping of a simple freezing chamber will save lives. It will greatly help expand vaccination programs, improve public health, and contribute to the eradication of disease. Additional benefits include preserving food so that farmers can get more of their produce to markets and for home owners to preserve food for their families. This design may even be used to help small businesses cool beverages.

-John Barrie,
The Appropriate Technology Design Collaborative



Mr. Barrie



Prof. Thompson

ELECTRICAL AND MECHANICAL ENGINEERING DESIGN PROJECTS

PRESENTATION SCHEDULE –Lake Superior Room

Course Coordinators: Prof. Erik Goodman and Prof. Craig Somerton

Faculty Advisors: Professors Aviyente, Brown, Gokcek, Khalil, Li, Mahapatra, Shaw and Strangas

Time	Project Sponsor(s)	Sponsor Contact(s)	Faculty Facilitator	Project Title
8:00 Lake Superior Room ECE 480	Midland Rotary Club, MSU RCPD and Chrysler Automotive	K. Mead S. Blosser	T. Brown	Beep Baseball Redesign of the Base Set
8:25 Lake Superior Room ECE 480	MSU RCPD, Midland Rotary Club and Chrysler Automotive	S. Blosser	S. Aviyente	Portable Audio-visual Book Reader
8:50 Lake Superior Room ECE 480	MSU Department of Zoology	D. Ostrom	C. Gokcek	Trace Gas Sample Introduction System: Part of the Field-Deployable Isotope Mass Spectrometer
10:00 Lake Superior Room ECE 480	Chrysler Automotive and UNESCO	K. Scheel	T. Li	Mondialogo Medical Diagnosis System
10:25 Lake Superior Room ECE 480	JMT NSF/WIMS ERC (Wireless Integrated Microsystems Engineering Research Center)	D. Aslam	N. Mahapatra	Wireless RFID Reader/Writer for WIMS Robot Tabletop Factory
10:50 Lake Superior Room ECE 480	WIMS ERC (Wireless Integrated Microsystems Engineering Research Center)	D. Aslam	H. Khalil	Obstacle-avoiding Wall-climbing Robot
11:15 Lake Superior Room ECE 480	Lear Corporation	W. Maue J. Natham	E. Strangas	Motor and Gearing Selection Program
11:40 Lake Superior Room ME 481	Lear Corporation	W. Maue J. Natham	S. Shaw	Advancement of Desk Chair Technologies for Children with Cerebral Palsy

MSU RCPD, CHRYSLER AND MIDLAND ROTARY CLUB: BEEP BASEBALL REDESIGN OF THE BASE SET

Beep baseball is quickly growing in popularity. Since its conception in the mid 1960s, this game has allowed people who lack complete sight to still participate in this country's national pastime: baseball.

Design Team 1's challenge for this semester was to redesign the current set of bases. One of the major drawbacks of the current set of bases is that they lack wireless functionality. This means that wires have to be strung every time a game is played. This leads to dangerous situations when runners approach the wires as well as major inefficiency in setting up the games. To resolve this issue, our group's main focus was to implement a wireless interface for the bases. Additionally, shipping costs for the current set of bases is extremely high. To lower these shipping costs, our design team decided to make the column section of the base inflatable. This will allow us to deflate the base, lowering the weight and reducing the size which will lower the costs of shipping.

Another major concern in the redesign of the bases was that we needed to have the base emit a sound that is clearly heard and distinguished by the players. Since the beep baseball creates sounds pitched above 1 kHz, we quickly realized that the bases need to output a low-frequency tone in order to be easily distinguished. Featuring all of these improvements, our new sets of bases are not only cheaper, but also safer, more portable, and more user-friendly.

<http://www.egr.msu.edu/classes/ece480/goodman/fall /group01>



N. Gingery
Electrical Egr



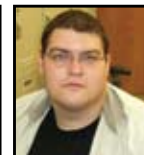
B. Thomas
Electrical Egr



Ki Yong Kwan
Electrical Egr



Feng Yu
Electrical Egr



S. Davis
Computer Eng



CHRYSLER



Project Sponsors
Midland Rotary Club
MSU RCPD
Chrysler Automotive

Sponsor Representatives
Mr. Keith Mead
Mr. Stephen Blosser

Faculty Facilitator
Prof. Terence Brown

Team Members and Non-technical Roles
Nathan Gingery
Manager

Samuel Davis
Webmaster

Ki Yong Kwon
Documentation Prep

Bryan Thomas
Presentation Prep

Feng Yu
Lab Coordinator



Mr. Blosser



Prof. Brown



MSU MRPCD, CHRYSLER AND MIDLAND MICHIGAN ROTARY: PORTABLE AUDIO-VISUAL BOOK READER

Many persons with disabilities such as visual impairment or dyslexia experience reading disabilities and difficulties. These individuals often rely on computer programs such as Kurzweil 3000 or Read Please to read text aloud to them. These computer applications use a text-to-speech converter in order to speak the printed text aloud while highlighting the corresponding text in synchronization with the voice synthesizer.

The PC-based reading technology and licensing costs limit the usability of such software to a confined PC lab station, making the applications non-portable and inconvenient for everyday use. However, the rapid advancement of portable audio players, such as mp3 players, opens up the possibility for innovations to be made in the realm of book-reading applications.

In an effort to provide a more flexible reading experience for persons with reading disabilities, *Michigan State University's Resource Center for Persons with Disabilities* is sponsoring this project to make use of existing portable mp3 player technology to create a portable audio-visual book reader. The objective was to create a portable media player that will perform as a convenient delivery system for books already scanned and converted for speech by the Kurzweil 3000 software.

The final product will be an inexpensive, portable mp3 player with an integrated visual display, which will present the printed text in synchronization with mp3 audio. Parameters such as cost, size, and usability will be optimized while maintaining a low-power-consumption system with high reliability.

<http://www.egr.msu.edu/classes/ece480/goodman/fall/group02/>



J. Cooper
Electrical Egr

A. Hallman
Electrical Egr

F. Okonkwo
Electrical Egr



J. Yang
Electrical Egr

J. Shim
Computer Egr



CHRYSLER



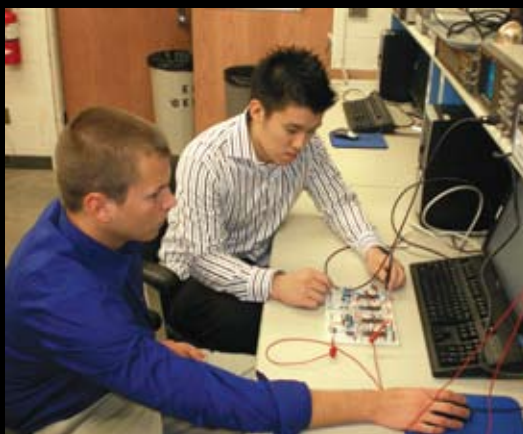
Resource Center for
Persons with Disabilities



Mr. Blosser



Prof. Aviyente



Team Members and Non-technical Roles

Jason Cooper
Manager

Jaeseung Shim
Lab Coordinator

Francis Okonkwo
Webmaster

James Yang
Documentation Preparation

Art Hallman
Presentation Preparation

Project Sponsors

MSU Resource Center for
Persons with Disabilities,
Chrysler and Midland
Michigan Rotary

Sponsor Representative

Mr. Steven Blosser

Faculty Facilitator

Prof. Selin Aviyente

MSU DEPARTMENT OF ZOOLOGY: TRACE GAS SAMPLE INTRODUCTION SYSTEM: PART OF THE FIELD-DEPLOYABLE ISOTOPE MASS SPECTROMETER

Our design team is building a Trace Gas Sample Introduction System (TGSIS) that will be used as a component of a larger system, the Field-deployable Isotope Mass Spectrometer (FIMS). Our system will filter a sample of air and pass on only CO₂ or N₂O to another component of the FIMS that measures its isotopic quantity. The TGSIS will use an elaborate system of valves, pumps, chemical traps, and heating and cooling elements controlled by a computer to separate unwanted gases from the sample as it is passed through the system.

Our project team is working in conjunction with Dr. Nathaniel Ostrom of the *MSU Department of Zoology*. Under his direction, we are selecting each component of the system and interfacing them together with a computer and special circuitry. Heavy emphasis is being placed on the controlling computer unit and a rotary valve that directs the flow of gas. Upon completion, our system will play a role in a relatively lightweight and portable device that will measure isotope mass fluctuations in remote areas.

<http://www.egr.msu.edu/classes/ece480/goodman/fall/group03>



B. Levesque
Electrical Egr



D. Ghiso
Computer Egr



P. Strefling
Mechanical Egr



J. Trzemzalski
Electrical Egr



A. Brannan
Mechanical Egr



D. Restauri
Electrical Egr



M. Jennings
Electrical Egr



D. Biegas
Mechanical Egr



Project Sponsor
MSU Department of Zoology

Sponsor Representative
Dr. Nathaniel Ostrom

Faculty Facilitator
Prof. Cevat Gokcek

Team Members and Non-technical Roles

Ben Levesque
Manager

Matt Jennings
Lab Coordinator

Dave Biegas
Lab Coordinator

Darren Ghiso
Webmaster

Paul Strefling
Webmaster

Joe Trzemzalski
Documentation Preparation

Adam Brannan
Documentation Preparation

Don Restauri
Presentation Preparation



Dr. Ostrom



Prof. Gokcek

CHRYSLER AND UNESCO: MONDIALOGO MEDICAL DIAGNOSIS SYSTEM

Our design team will refine the *Mondialogo* remote medical diagnostic system initially created by an ECE 480 design team in spring, 2007. The device is designed to provide medical screening at no cost to patients by providing accurate, safe, and understandable measurements with real-time results, without the need for highly trained medical personnel to perform the screening.

The team includes partners from HuaZhong University of Science and Technology (HUST, Wuhan, China), a biomedical engineer from the University of Bologna (Italy), and has expanded further to include medical students from MSU's College of Human Medicine. Together, our goals for the project are to enhance the following modules implemented last semester:

- Blood pressure measurement – MSU group
- Temperature measurement – MSU group
- Glucose measurement – MSU and Bologna groups
- Electrocardiogram (ECG) – HUST group
- Oxygen saturation measurement – HUST and Bologna groups
- Wireless infusion bottle warning system – HUST group

With the assistance of the medical team, we aim to increase the accuracy of the modules as well as improve interpretation of the results.

The focus this semester is implementing a fully functional, picture-based GUI along with moving from the ARM microprocessor embedded system to the more available X86 architecture. Our greatest challenge still remains in the integration of the individual modules with the central GUI.

<http://www.egr.msu.edu/classes/ece480/goodman/fall/group04/>



R. Badon
Electrical Egr

M. Barnes
Electrical Egr

T. Black
Computer Egr

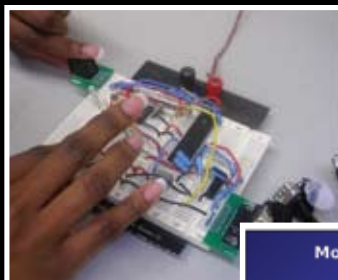


R. Bloodworth
Computer Egr

R. Mackey
Electrical Egr



Mr. Scheel



Temperature
module on
protoboard



Prof. Li

New GUI
design
for health
monitor
touchscreen
interface



Project Sponsors
Chrysler Automotive and
UNESCO

Sponsor Representative
Mr. Kevin Scheel

Faculty Facilitator
Prof. TongTong Li

**Team Members and
Non-technical Roles**
Robyn Badon
Manager

Terrell Black
Webmaster

Ryan Bloodworth
Documentation Prep

Robyn Mackey
Presentation Prep

Michael Barnes
Lab Coordinator