



ENGINEERING NEWS

WIRELESS ENABLED REMOTE CO-PRESENCE PROJECT ENTERS NEW TESTING PHASE

By Harold Underwood

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A team of students, faculty and off-campus partners has been working over the past year to develop a third generation prototype of the Wireless Enabled Remote Co-Presence (WERCware) system. WERCware is being designed to provide remote coaching for people with a variety of special needs, from high functioning autism to traumatic brain injury, so they can benefit from effective job training and/or more independent living. In the third generation of WERCware, an Android smartphone is used to establish a Skype connection between the participant and a coach at an internet connected computer in a remote location. The coach will be professionally trained to provide instructions and/or usher the participant through any crisis events. Unique task tracking software has been developed for the coach to assess progress by the participant during training activities. A specialized mounting apparatus has also been designed to prepare for a study being conducted in conjunction with



Volunteer Val Davis assembles a Bento Lunch Box aided by instruction via WERCware.

United Cerebral Palsy (UCP) this fall. In the study, a fully wireless security camera system will also monitor activities remotely at the participants residence. The team is looking forward to getting feedback from the study to inform future development of WERCware toward achieving a level of efficacy much anticipated by those who stand to benefit.

Currently those working on the project include: IPC engineering project students Josiah Merola and Chad Clemens; communication technology group student leader, Stephen Powers; associate professor of special education and special education program coordinator, Dr. Nancy

Patrick; associate professor of engineering and communication group faculty advisor, Dr. Harold Underwood; SymBionyx personnel, including its technical director Mr. Bill Weder and CEO and founder, Mr. Curt Byers. Thanks also to many other former students, current faculty and other off-campus partners that have played a significant role in helping the WERCware assistive communication technology reach its current stage. Previous funding has been received in the form of grants from the Innovation Transfer Network (ITN) of Central PA and the PA Department of Education.



Barb Ressler prepares centrifuge tubes for cell cultures.

BIOMEDICAL ENGINEERING CELL CULTURE LAB FINDS A NEW HOME

By Barb Ressler

Frey 258 which has been the office of the electrical engineering technician for many years has now become the new home to a cell culture lab for biomedical engineering. This room has been outfitted with all the equipment needed to grow cells in a laboratory setting, including a tissue culture laminar flow hood, an incubator and a refrigerated centrifuge. Don't worry—you can still find our electrical technician, Paul Myers, in Frey 256, the office next door.

“Not only does this lab teach how we assess material compatibility in living systems, it also introduces students to the field of tissue engineering.”

The new facility will be used in the biomedical engineering (BME) curriculum. In the BME Design course, students perform a biomaterial compatibility experiment to determine if certain materials are toxic to cells cultured in a dish. The students grow their own mouse cells, then put them in contact with commonly used materials and measure the cell viability af-

ter exposure. Not only does this lab teach how we assess material compatibility in living systems, it also introduces students to the field of tissue engineering.

A new research project is also starting in the BME cell culture lab. Researchers in Macha, Zambia hope to grow malaria parasites in the lab in order to study the development of drug resistance in the parasites. However, growing the parasites in the lab can be difficult, especially in a rural location such as Macha. Dr. Ressler's research project will be to optimize the parasite culture process for use in Macha. The new project will be up and running in September, with students coming on to assist later in the semester.

One reason for moving the cell culture facility from its original home in the basement to the second floor of Frey was to provide a more secure location for bio-hazardous materials. The laboratory door has several signs on it warning of the dangers within. These signs are standard safety procedure and should not be alarming—you can visit the facility without fear of catching malaria or any other infectious disease, as long as you don't take a drink from the bottles in the refrigerator! So please come by and visit us the next time you are visiting the second floor of Frey Hall.

EXTREME MESSIAH ENGINEERING LABS MAKEOVER

By John Meyer and Paul Myers,
engineering staff members

What do you call an engineering department, which in the summer literally modifies or is working on something in every lab and... creates a new lab from what had previously been an office? Would you refer to this as progressive, innovative, radical or insane? While at times it was definitely insane to think this could all be facilitated prior to the start of the fall semester, in the engineering department we are simply referring to it as “The Extreme Messiah Engineering Labs Makeover.” All projects have a beginning and this one began in fall of 2011 when Dr. Fish requested a complete utilization analysis of our engineering lab space. The analysis confirmed the lower level labs—F045, F049 and F051—were becoming increasingly constrained with newly required lab equipment, additional space requirements for projects and a growing engineering enrollment. In contrast, our second floor labs—F252, F254 and F266—were underutilized in terms of scheduled labs and could provide increased space to facilitate the increased growth in engineering. With this assessment of the situation, our brain storming began with an emphasis on thinking outside the (conventional) box. Some creative solutions were developed and the planning began, which would enable us to move forward with “The Extreme Messiah Engineering Labs Makeover.” When the dust finally cleared, the following changes to each respective lab occurred:

- Frey 045 Biodiesel Lab—Reconfiguration resulting in more efficient utilization of the space
- Frey 045 Fluids Lab—Moved in the new flume; removed cabinets and a bench; and relocated all the biomedical equipment to Frey 258 (formerly electrical and computer engineering technician's office on the second floor) to establish a new biomedical lab

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- Frey 049 Materials Lab—Worked to market the disbursement of the electron microscope
- Frey 051 Manufacturing Lab—Disassembled and relocated the entire Legos Manufacturing System to Frey 266 lab and moved benches in to re-appropriate the space for various projects within the Transportation group and the Oxygen Concentrator Project, which is associated with the Biomedical Group in the Collaboratory
- Frey 068 Project Lab—Moved furniture for more efficient utilization of space
- Engineering Storage Building—All biodiesel production equipment from the Low Street, Grantham facility was relocated, setup and reorganization to provide additional storage for various water projects
- Frey 252 Projects Lab for Electronics—Installation of five new i5 core pcs and associated software; complete reconfiguration of the space with six new work benches and associated project carts; and installation of the relocated Legos Manufacturing system in the center of the lab
- Frey 254 General Purpose Engineering Lab—Installation of twelve new i5 core pcs and associated software and relocation of a furnace from Frey 049 along with the two ENGR 374L Heat Transfer Analysis and Design labs also relocated from Frey 049
- Frey F258 Electrical and Computer Engineering Technician's office—Relocated desk and all items to Frey 256 engineering equipment resource room; and relocated and setup all biomedical equipment and associated items from Frey 045
- Frey 266 Electronics Lab—Installation of fifteen new i5 core pcs and associated software; removal of all cabinets and drawers under four benches and installed new metal H legs under bench tops; installation of 12 new swing arms for flat panel monitors; in addition to the regularly scheduled ENGR 262L Circuit Analysis lab, the schedule now includes two MWF Electronics Engineering classes taught in this lab—ENGR 262 Circuit Analysis and ENGR 340 Analog Electronics

As you can clearly observe, this was a very busy summer in what was definitely “The Extreme Messiah Engineering Labs Makeover.”

FACULTY OPENING

The Department of Engineering in the School of Science, Engineering and Health at Messiah College invites applications to a full-time/term-tenure track faculty position at the assistant professor level. Applicants must have a Ph.D. in Engineering as well as demonstrated teaching excellence at the college level. This opening will require teaching traditional engineering classes both in the candidate's field of expertise and standard, cross-discipline engineering courses. The required discipline specific course load will be tailored to fit candidates with training in civil, electrical, environmental or mechanical engineering. Professors in the engineering department are expected to fill department leadership roles in addition to their classroom teaching. There are currently two open leadership roles available to candidates applying for this position. The department's Energy Group in the Collaboratory at Messiah College (www.messiah.edu/collaboratory) has an opening for a program director. This director will work with students to pursue applied research and engineering design interests in environmentally sustainable energy with an emphasis on support for internationally diverse underserved communities. The growth of our environmental engineering concentration and the newly approved concentration in civil engineering has also generated an opening for a faculty member to oversee the curriculum and student advising in these concentrations. As many of the department's applied research programs involve applications in

developing countries, international development experience is also strongly preferred for this position. Salary is commensurate with qualifications and experience. Applicants should electronically submit a letter of application indicating areas of specialization, a brief statement of research interests consistent with either the energy group program director or the environmental/civil concentration supervisor, their curriculum vitae, a copy of official transcripts, three reference letters and a completed Faculty Application Form (Application may be accessed at: messiah.edu/offices/hr/forms/Faculty_Empl_Appl.pdf). Please address all inquiries, applications and nominations to:

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Messiah College, a Christian college of the liberal and applied arts and sciences, does not discriminate on the basis of age, color, ethnic/national origin, disability, race, gender or veteran status in its education programs, admissions or employment policies. Women and minority candidate are encouraged to apply.

The mission of Messiah College is to educate men and women toward maturity of intellect, character and Christian faith in preparation for lives of service, leadership and reconciliation in church and society. Graduates of the engineering program will therefore be technically competent and broadly educated, prepared for interdisciplinary work in the global workplace. The character and conduct of Messiah engineering graduates will be consistent with Christian faith commitments. We accomplish this mission through engineering instruction and experiences, an education in the liberal arts tradition and mentoring relationships with students.

FIRST-YEAR STUDENT PICNIC: some students and faculty who enjoyed the event



Adam Gottshall and Casey Bechard



L to R: Rachel Mazurek, Christian Rogerson, Adam Pozun, Stephen Smeiles, Hannah Martin



L to R: Laura Castilow, Sara Scheidt, Katie Price, Elizabeth Bashore, Bob Clancy, Amanda Luger, Katie Moyer



Back L to R: Professor Randy Fish, Hing Jii Mea, Jared Detweiler, Adam Gottshell, Katie Barrett. Front (L to R): Katie Moyer, Amanda Luger