

FP_{monthly}

FP_{monthly} - An internal news digest for all center members including industry supporters, researchers, students, and affiliated organizations.

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UPDATES

New Education Hire at the CCEFP



The Education and Outreach initiatives of the CCEFP have been restructured to handle the increased level of education and outreach activity of the Center. Effective immediately, the Education Director position will be shared between Will Durfee and Linda Western. Both will have the title of Education Co-Director. We are very pleased that Linda Western has agreed to take on the additional responsibilities of the Co-Director position. We are also pleased to announce that Stacy Klein of Vanderbilt University has agreed to chair the CCEFP Education Advisory Board effective immediately, and want to thank Linda Western for her effective leadership of the EAB during the first year of the Center.

CCEFP Display at the Minnesota State Fair!



The CCEFP exhibited a display at the Minnesota State Fair on Sunday, Sept. 2 and Monday, Sept. 3, in the University of Minnesota Building. The CCEFP display is an interactive exhibit that allows the operator to witness how energy regeneration is possible for a passenger vehicle. Built by the senior mechanical engineering design class as a capstone project, the exhibit allowed a hands-on approach for fair goers. Presently, it is being modified into a permanent exhibit for the Science Museum of Minnesota. The concept of energy regeneration holds great promise for future hybrid vehicles to greatly improve fuel economy, and will be demonstrated in the small urban vehicle test bed being built at the University of Minnesota.

UPCOMING EVENTS

Save the Dates

CCEFP Annual NSF Site Visit: February 21 – 22, 2008. University of Minnesota

CCEFP Annual Meeting: May 28 – 30, 2008. Milwaukee School of Engineering

Fluid Power Documentary

Stephanie A. Bettermann, Administrative Director

CCEFP, in conjunction with the National Fluid Power Association and Twin Cities Public Television, is currently producing a two-part documentary on fluid power. The first 30-minute documentary will focus on an in-depth introduction of fluid power. This documentary is aimed at K-12 children, and a general audience with no knowledge of fluid power. The second documentary, which is also being sponsored in part by several international fluid power societies, will emphasize current research in the field, with the intention of highlighting careers in engineering.

The production of the documentaries included interviews with core faculty from several CCEFP institutions who flew to the Twin Cities to take part in the filming. Several graduate students were also interviewed, as well as a

number of engineers from industry. The shooting took place at several locations, including MTS, Eaton, Toro, the University of Minnesota, and the Science Museum of Minnesota.

Once the documentaries are completed, CCEFP will have full rights to the introduction to fluid power video, which will allow the Center to widely distribute the videos to industry and use for a variety of educational purposes. The in-depth research and recruitment video will belong to NFPA and the co-sponsors. TPT, an affiliate of PBS, will broadcast the documentaries in Minnesota in April. Affiliate stations around the country will also have a chance to air the series in their market as well. For more information, please contact Stephanie Bettermann at sbetter@umn.edu.

RESEARCH

Kim A. Stelson, Center Director

The CCEFP is applying systematic management techniques to its operation. This is crucial because of the large numbers of projects and organizations involved. The five essential processes of modern management we are focusing on are strategic planning, project selection, budgeting, progress tracking and communication. We are continuously developing, implementing and refining procedures for each of these processes.

The most recent implementation was of the progress tracking process. Beginning this year, progress will be tracked three times per year for all research, education and outreach projects. Research projects are tracked by the CCEFP Executive Committee, committee of CCEFP faculty, student and industrial representatives. During a recent all-day teleconference, each research project gave a ten-minute progress report followed by five minutes of questions.

The projects were evaluated using traffic light symbols where "green" means that the project is on track, "yellow" means that the project has minor setbacks, and "red" means that the project has major setbacks. Of the twenty-eight projects that were evaluated, twenty-three were ranked green and five were ranked yellow, showing that research in the center is making rapid progress, and that an effective means of identifying and dealing with concerns has been developed. For any project ranked less than green, an action plan to bring the project back on track will be developed by the Deputy Director, Thrust Leader and Project Leader. A parallel progress tracking process for education and outreach projects is now being developed, and a teleconference to track progress on education and outreach projects is planned for the next few weeks.

INDUSTRY

Michael J. Gust, Industrial Liaison Director

One of the most important benefits that we can offer our industry members is that of exclusive access to any intellectual property that we develop here at the CCEFP. As such, we need to inform our members whenever any new patent disclosures are created within the Center. However, it is paramount that we do so in a highly confidential and secure manner as to do so else wise might risk public disclosure which would render the patent invalid. We are in the process of putting the finishing touches on a new "secure access" area that is accessible through our "Members Only" section of our website. Once completed we will post these types of sensitive documents there so that those individuals, identified by our industry member companies as having responsibility for determining their interest level in the intellectual property, can gain confidential access. Stay tuned for more announcements.

EDUCATION and OUTREACH

**Future
SOLUTIONS
NOW!**

Support an intern! The CCEFP Internship Program for engineering students is one of the Center's key initiatives. This program provides opportunities for engineering students to gain hands-on knowledge of hydraulic and pneumatic principles and applications through first-hand experiences with fluid power industry leaders. These internships also facilitate industry's access to a diverse, talented pool of engineering students. For information on internship opportunities visit <http://www.ccefp.org/internship>, or contact Alyssa Burger, Education & Outreach Director at 612.624.4991 or aburger@me.umn.edu.

CCEFP REU Wins Award!



Agricultural Engineering Senior, won first place in the undergraduate category of the poster competition at the Great Midwest Regional Space Grant Conference.

Stephen Moran, AE Senior, won first place in the undergraduate category of the poster competition at the Great Midwest Regional Space Grant Conference. The conference was held at Purdue University on September 6 – 7, 2007. Stephen's poster, titled "Biomimetic Nano-Surface Creation for Drag Reduction in Fluid Power Systems" was based on research he conducted with Professor Eric Loth and AE graduate student Adam Steele as part of the Illinois Space Grant's Summer 2007 Undergraduate Research Opportunities Program (UROP). As an award recipient, Stephen gave a presentation on his work to the conference participants. Written by Dianne Jeffers. Posted on September 11, 2007.
ae.engr.uiuc.edu/news/articles/article41.html

CCEFP Annual Student Retreat



The students of the CCEFP had their first annual retreat at Vanderbilt University in Nashville, TN, August 9 – 11. The event hosted more than 18 students and staff from within the Center. Students had the opportunity have campus and lab tours at Vanderbilt, hosted the bi-weekly Center Webcast, had a presentation on Intellectual Property by Mr. Michael Gust, and spent an afternoon presenting their individual research projects. The students had a tour of downtown Nashville and the Student Leadership Council held one of their quarterly meetings. To conclude the successful retreat, the students participated in a group activity in which teams of three brainstormed, designed and created an educational workshop for kids on fluid power systems. The retreat served as a networking and social activity as well as secured friendships and relationships that will follow these students throughout their careers. The Center thanks all of the students that participated. A special pat-on-the-back goes out to Jose Riofrio (see Getting to Know Us) for planning and organizing the retreat. The next CCEFP Annual Student Retreat is tentatively scheduled for August 2008 at the University of Illinois, Urbana-Champaign.



GETTING TO KNOW US

Students



Rikki Vinsun will graduate in December of '07 with a B.S. in Industrial Engineering from North Carolina A&T State University. Upon graduation Rikki will pursue a master's degree in human factors engineering with a concentration on cognition and decision making. Rikki works with the research group at A&T studying the human factors relationship to the research conducted within other areas of the Center. Last academic year, Rikki worked with the user centered design team. The goal was to develop user profiles for the rescue crawler. These profiles aid in developing the user interface in that it allows for the designer to know what population one is designing for. This way one can account for certain parameters that may or may not be important for other populations. Rikki is also the Outreach Coordinator in the Student Leadership Council. Outside of the lab, she enjoys traveling and visiting friends and family. Rikki also enjoys reading, music and shopping.



Jose Riofrio received his undergraduate degree in Physics from Elizabethtown College, Elizabethtown, PA. Jose graduated from Vanderbilt University in 2005 with his Masters in Mechanical Engineering and is currently pursuing his PhD from Vanderbilt as well. His research within the center is focused on portable pneumatic power supply for pneumatic robots of human-like power (in the neighborhood of 100W). Put simply, they are trying to generate feasible ways to equip these robots with an air compressor so they can use compressed air as their power source. The challenge is in achieving efficiency and compactness (both in size and weight), while being capable of meeting the robot's power demands. The approach taken is a free liquid-piston engine compressor. Essentially, this is a small internal combustion engine whose "piston" is a slug of fluid (currently water) trapped

between two elastomeric diaphragms, and oscillates back and forth due to the elasticity of these. The term "free piston" means that there are no kinematic linkages attached to the piston (connecting rods, crankshaft, etc.) so it presents purely dynamic characteristics. The resulting arrangement is an air pump, where the pulsating combustion of propane acts as the driving force on one side of the liquid-piston, and the pumping occurs on its other side. Outside of the lab, Jose spends most of his weekends rock-climbing. He also loves traveling and planning new trips. Ideally, Jose would like to live and work all over the world!

Researcher



John Lumkes earned his undergraduate degree from Calvin College and his master of science and engineering and biomechanics from the University of Michigan. He completed his PhD from the University of Wisconsin at Madison in 1997. John started his academic career as an assistant and associate professor in the Department of Mechanical Engineering at Milwaukee School of Engineering. He developed MSOE's electrohydraulic controls course and taught undergraduate courses on fluid power. John authored a book in 2002 titled "Controls State for Dynamic Systems." In 2004, John was hired at Purdue University in the Agricultural and Biological Engineering Department where the the traditional fluid power courses and activity resides. John works on the On/Off Valve Basic Control project, which is a new initiative in the Center. The work is similar and complimentary to the work done on the PWM valve. It is a digital on/off valve which stays open or closed; however, it can be in different applications with the same result. John also contributes to the small Urban Vehicle and Excavator test beds. John is active member of the Center's education initiatives and serves as the Chair of the Education Outreach Network. Outside of the lab, John is building an airplane which seems natural as he lives on an airstrip. John loves to fly and spend time with his three children.

Leadership Team



Steven (Xiaochun) Jiang earned his undergraduate degree in mechanical engineering from East China Institute of Technology and his Master's degree in Manufacturing Engineering from Nanjing University of Science and Technology. In 2001, Steven completed his PhD in Industrial Engineering from Clemson University. He is currently an assistant professor at North Carolina A&T State University. Steven's research is in the Efficiency Thrust within the CCEFP. At NCA&T the faculty and students are investigating human factors issues in fluid power systems. It is important to apply user-centered design philosophy into fluid power systems as many of those systems are designed for human operators to use. The systems need to be involved in the entire design life cycle. Steven's research team is applying usability engineering to the human machine interface design and is looking at modeling human performance in fluid power systems where human operators interact with machines to improve overall system performance. Steven also serves on the management team of the CCEFP. Outside of the lab, Steven enjoys hiking visiting national parks.

Please send comments, questions, or submissions to:
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