IEEE Advancing Technology for Humanity

Madison Section Newsletter

Find the online archive at http://ieee-msn.truenym.net/news.html

Vol. 15, No. 5 *Serving IEEE Members of South Central Wisconsin* **May 2012**

Nanogenerators: Generating Electricity from the Human Body

Date: **Thursday, May 17, 2012**
Time: 12:00pm - 1:00pm
Speaker: Dr. Xudong Wang, UW-Madison Dept. Materials Science & Engineering
Agenda: Informal networking will begin at 11:30am.
Presentation will begin at 12:00pm.
Location: Promega BioPharmaceutical Technology Center
5445 E Cheryl Pkwy, Room Number: 122
Madison, WI 53711
Menu: Pizza buffet provided: $5 for IEEE members, $10 for non-members, free for students.
RSVP: Deadline: May 14. Go to https://meetings.vtools.ieee.org/meeting_view/list_meeting/12321 to register. Please send questions or difficulties to Mark Vincent at mvincent@ecw.org.

Non-member guests are always welcome!

Abstract

Harvesting energy from ambient mechanical energy sources is a promising strategy for powering small electronics and eventually achieving self-powered electronic devices. The self-powering capability allows electronic device packages to exclude bulky energy storage components and makes possible forgoing the inclusion of bulky battery components in electronic device. The resultant self-charging and small form factors are particularly important features for implantable biomedical devices, where replacing batteries may be challenging or even impractical. Recent development of nanogenerators has demonstrated a promising solution for the design of self-sufficient implantable power source. By using piezoelectric nanomaterials as the functional elements, low-density energies from heartbeats, muscle stretching, or blood circulation may be converted into electricity via the direct piezoelectric effect. Previous nanogenerator models were mostly built on biocompatible piezoelectric zinc oxide nanowire arrays, which can harvest energy from acoustic waves or force/pressure fluctuation. Recently, we developed a technique that uses piezoelectric polyvinylidene fluoride (PVDF) micro belts to convert the energy from low-speed airflow to electricity via their resonant oscillation. The PVDF microbelts were able to generate sufficient electrical energy from low speed air flow for the sustained operation of small electronic devices. This capability is ideal for harvesting energy from respiration, which has been demonstrated using a simulated breath system. This is a new and possibly practical strategy of drawing energy from regular.

Biography

Dr. Xudong Wang is an Associate Professor UW-Madison Department of Materials Science and Engineering, and directs its laboratory for Nanoscience and Nanotechnology. Dr. Wang is an expert on nanomaterial synthesis and characterization, piezoelectric nanostructures, semiconductor nanodevices, nanoelectronics, nanosensors, and renewable energy. He has a Ph.D. in Materials Science and Engineering from Georgia Institute of Technology, an M.E. in Chemical Engineering from Hunan University, China, and a B.S. in Materials Science and Engineering from Jilin University, China. Hi major fields of interest are nanomaterials growth and characterization, piezoelectric nanostructures and nanodevices for energy harvesting, and nanodevices for sensors, optoelectronics, and biomedical devices. he has published dozens of books, book chapters, journal papers, and conference papers in these fields of study, including Science magazine, where he presented his work on generating electricity from the body. Some of his awards include: Ross Coffin Purdy Award, American Ceramic Society (2009), KAUST Research Fellow (2008), Sigma Xi Best Faculty Paper Award, Georgia Tech (2008), Young Innovators Under 35 Award (TR35) by Technology Review Magazine (2007).

IEEE Entrepreneurs & Consultants Network, Madison Networking Meeting

Date: Thursday, June 7, 2012
Time: 12:00pm to 1:00pm
Purpose: Presentation, topic TBD.
Location: TBD
Parking: TBD
Process: Members are encouraged to make introductions, describe endeavors, and make request for: contacts in target companies, needs, resources. Bring your elevator speech and rolodex!
RSVP: Tim Chapman (PrettyGoodGUIs@TrueNym.NET)

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Glacier Hills Wind Park Tour!

starting from University of Wisconsin-Madison

Date: **May 22, 2012**
Time: 4:00pm to 8:45pm
Speaker: Mitch Bradt, PE, Dept. of Eng. Professional Development
Agenda: 4:00pm … Bus leaves from Engineering Hall at 4:00pm sharp!
5:10pm … Arrive at GHWP
5:15pm … Meet We Energies --TOUR
6:45pm … Tour ends. Board Bus for return to campus--we will stop for dinner
8:45pm … Bus returns to Engineering Hall at 8:45pm.
Location: UW Engineering Hall
1415 Engineering Drive
Madison, WI 53706
Menu: No lunch meal provided: $5 for IEEE members, $10 for non-members, free for students.
RSVP: Deadline: May 21. Go to https://meetings.vtools.ieee.org/meeting_view/list_meeting/12323 to register. Please send questions or difficulties to Mitch Bradt at bradt@wisc.edu

Non-member guests are always welcome!

Abstract

The Glacier Hills Wind Park, located in the towns of Randolph and Scott in Columbia County, is designed to generate 162 megawatts (MW) of electricity and will be capable of powering approximately 45,000 average residential homes. The site will consist of 90 Vestas V-90 1.8 MW Type 3 turbines. Construction began on May 17, 2010, and will be completed by the end of 2011. The project is being constructed by a Wisconsin-based alliance that includes The Boldt Company of Appleton, Michels Corporation of Brownsville and Edgerton Contractors, Inc. of Oak Creek. This tour will include a presentation during the bus ride to the site on some electrical aspects of the Type 3 turbine and the GHWP. While on the tour, a We Energies Project Engineer will discuss the development, layout and construction of the GHWP project, including a visit to one of the turbines and to the collector substation. Rick O'Conor will provide the tour of the wind farm and Louis Carraci, GHWP Plant Manager, will provide the substation tour.

Biography

Mitch Bradt is a Program Director for continuing engineering education in the disciplines of Wind Energy, Power Electronics, Electrical Distribution and Electrical Safety. Prior to being in academia, he has been a consulting engineer designing substations and wind farms, has worked at a manufacturer of grid connected power electronic equipment (D-SMES, D-VAR, STATCOM), and got to blow up aircraft while serving the US Air Force. He received his BSEE from Marquette University in 1993 and MSEE with a focus on Utility Application of Power Electronics from the University of Wisconsin-Madison in 1996.

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SECTION Meetings

The third Thursday of Jan.-May and Sep.-Dec. is reserved for a meeting to provide recent research, developments, trends and/or innovations in one of our membership's technical areas.

NETWORKING Meetings

The first Thursday of even numbered months is reserved for a meeting to provide networking opportunities for members who are consultants or entrepreneurs. Bring your elevator speech and rolodex!

Section Meeting Schedule for 2012
(schedule subject to change)

January 19, EU e-Freight Software Initiative
February 16, Patent Law
March 15, Reverse Electrowetting
April 27, Signal Processing

May 17, Electricity Nanogenerators
by Prof, Xudong Wang, at Promega

May 22, Annual Wind Farm Tour
busses start/end at UW Engineering Hall

June 21, TBD

September 20, TBD

October 18, International Trademarks
by Richard Abegglen, at Promega

November 15, TBD

December 20, TBD

Networking Meeting Schedule for 2012
(schedule subject to change)

February 2, TBD

April 5, TBD

June 7, TBD

August 2, TBD

October 4, TBD

December 6, TBD

Join the Madison Section Network at LinkedIn

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Selection of Officers

At the December monthly meeting, the IEEE Madison Section conducted its annual officer elections prior to the presentation:

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IEEE Membership Level Upgrades

Those interested in upgrading their IEEE membership level should send their resumes or other information showing five years of significant performance in an IEEE-designated field to Charles J Gervasi (cj@cgervasi.com). Madison Section Board will attempt to find Senior IEEE members knowledgeable in the applicant's area of practice who may be able to provide references. You are invited to attend the informal networking portion of the monthly Section meetings (starting at 11:30am) to meet the Section Board members and discuss intentions.

2012 Section Board Members

David Marca	Chair
Steve Schultheis	Vice Chair
Charles Gervasi	Treasurer
Mark Vincent	Secretary
Timothy Chapman	Webmaster
Tom Kaminski	ECN Chair
Mitch Bradt	Member at Large
Clark Johnson	Member at Large
Dennis Bahr	Member at Large
Craig Heilman	Member at Large
Sandy Rotter	Member at Large

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For address changes: notify IEEE headquarters at: http://www.ieee.org/ or address-change@ieee.org. Editorial or comments contact: David Marca at: dmarca@openprocess.com.

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