

Center for Community Health

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AutoSense: Computer Science Meets Community Health

At the recent *American Academy of Health Behavior* conference, a reoccurring theme was how advancement in health behavior research has been severely held back by a lack of high-quality tools to accurately and easily assess health behaviors in real-time. Researchers continue to rely, for the most part, on paper-and-pencil measures to assess important health behaviors such as diet, physical activity, and secondhand smoke exposure. These instruments often are cumbersome for people to complete, and not sufficiently accurate because they are retrospective and tax people's memories. NIH and other funders are now challenging researchers to create trans-disciplinary teams to tackle this problem by developing high-tech instruments that can accurately assess behavior in real-time. Dr. Santosh Kumar, a new assistant professor in the Department of Computer Science, has taken this challenge to heart. With the help of the CCH, he put together a team to respond to an NIH request for proposals (RFA) to develop better ways to assess

psychosocial stress and exposure to addictive substances. Below, Dr. Kumar answers a few questions about this project, known as "AutoSense."

How did the idea begin?

The idea for the AutoSense project emerged when Dr. Satish Kedia (Anthropology) and I discussed a NIH RFA, which sought proposals toward establishing a Biology Exposures Program as part of a larger Genes and Environment Initiative (GEI). This RFA was seeking new tools that could collect precise data on personal exposures to addictive substances and psychosocial stress on a continuous, real-time basis.

Tell us about the team you put together.

We began searching for an appropriate portable alcohol sensor that could provide real-time measurements of alcohol



exposure noninvasively and accurately. This led us to SpectRx Inc., a portable ISF-based alcohol sensor manufacturer. They became interested in joining our team. Simultaneously, we began exploring sensors to measure personal exposure to psychosocial stress. This led us to invite a researcher from Ohio State (Dr. Emre Ertin) to our team. Dr. Ertin had prior experience in putting together stress-related sensors on the wireless sensor mote platform.

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Check out this short course in proposal writing available online.

<http://foundationcenter.org/getstarted/tutorials/shortcourse/info.html>

It is adapted from *The Foundation Center's Guide to Proposal Writing* 5th ed. by Jane C. Geever.

New Grants Funded

Congratulations to our affiliates who recently received funding for their research!

The AAHPERD Research Consortium funded **Weidong Li's** (Health and Sport Sciences) Established Investigator Grant proposal entitled, "An in-depth qualitative exploration of overweight or obese adolescents' and their parents' coping mechanisms against obesity bias."

Sigma-Tau Health Science, Inc. recently awarded funding to **Richard Bloomer** (Health and Sport Sciences) for his proposal entitled "Effect of oral GPLC intake on nitric oxide and oxidative stress in response to reactive hyperemia."

Santosh Kumar and a team of his colleagues from the Computer Science Department have been awarded a TAF Innovation grant to introduce "Smart Dust" technology in Computer Science courses here at the U of M. Students in several Computer Science courses will get an opportunity to learn this new technology and use it in their class projects.

Claudia Sims and **Nan Lackey** (Nursing) received a grant in the amount of \$14,962.00 from The Promise of Nursing for Tennessee Nursing School Grant Program administrated by the Foundation of the National Student Nurses' Association. The purpose of the grant is to help increase enrollment in Loewenberg School of Nursing (LSON). This

will be done through the use of simulation by providing a consultant who will teach faculty how to incorporate simulation into their undergraduate clinical courses. Additionally, the grant will be used to equip LSON simulation laboratory with a Noelle Birthing Manikin and a Nursing Kid Manikin so simulation can be incorporated into the Maternal Child clinical courses.

Robert Koch, Nancy Mele, **Nan Lackey** (Nursing), and **George Relyea** (Center for Community Health) received a grant from The University of Memphis TAF Innovation and Single Investigator/Small Team for \$9,752.00. The goals of the grant are to: capitalize on the unique characteristics

of podcasting by providing routine and regular addition of new course content that automatically downloads and can be accessed anywhere, anytime; conduct a formative evaluation to determine the best media format in which to receive lectures, improve class performance and increase student satisfaction; and to build on LSON experiences to promote sustainability. This grant enabled the School of Nursing to purchase 40 iPods for students to use with other media in the Pharmacology course.

AutoSense—continued

In order to design effective experiments, we added Dr. Ken Ward (Health and Sport Sciences), a team member who had experience in conducting both lab and field studies on stress and addiction and lab study expertise in a Neuroscientist, Dr. Mustafa al'Absi (University of Minnesota).

Our transdisciplinary team for the AutoSense proposal was born!

What's the current status of the project?

Our proposal has made it through NIH's first stage of review and was received very well. We are now working on integrating other non-invasive and real-time

sensors to measure personal exposures to environmental smoke.

What does the future hold for your research team?

The AutoSense project could open doors to a promising new future where reliable and objective data on personal exposures to

numerous addictive substances and various types of psychosocial stress can be collected from the field. All of this will be achieved without burdening the participants, thus enabling large scale studies. The new possibilities are virtually endless.

Recent Affiliate Proposals, Publications, and Presentations

Alvanzo AAH, **Boykins A**, Plichta S, Leisey M, Forte J, Carson S. Differences in characteristics of victims of sexual assault, domestic violence, and other violent crimes who present for forensic exam [poster abstract], in Proceedings of the 2007 National Conference on Health and Domestic Violence, San Francisco, CA. 2007.

John Amis and **Paul Wright** recently attended the Active Living Research Grantee Meeting and Annual Conference where they co-chaired a roundtable on conducting research in schools.

Beck TW, Housh TJ, **Fry AC**, Cramer JT, Weir JP, **Schilling BK**, Falvo MJ, and Moore CA. The influence of muscle fiber type composition on the patterns of responses for electromyographic and mechanomyographic amplitude and mean power frequency during a fatiguing submaximal isometric muscle action. *Electromyography and Clinical Neurophysiology*, 47:000-000, 2007.

Bloomer RJ, Creasy AK, and Smith WA. Physical work-induced oxidative stress is exacerbated in young cigarette smokers. *Nicotine and Tobacco Research*, 9(2): 205-211, 2007.

Bloomer RJ. Glycine Propionyl-L-Carnitine: Health and Cardiovascular Dietary Support; *Natural Products Expo West*, Anaheim, CA, 2007.

Boykins AD, Alvanzo A, Carson S, Forte J, Leisey M, Plichta S. Care characteristics of recent sexual assault victims [poster abstract], in Proceedings of the International Society of Psychiatric-Mental Health Nurses 9th Annual Conference, Montreal, Quebec, Canada. 2007.

Boykins AD, Mynatt S, Martin JC, Shephard C, **Relyea G**. Characteristics and follow-up of adult female victims of recent sexual assault [poster abstract], in Proceedings of the National State of the Science Congress in Nursing Research, Washington, DC. 2006.

Falvo MJ, **Schilling BK**, and **Weiss LW**. Techniques and considerations for determining isoinertial upper-body power. *Sports Biomechanics*, 5:293-311, 2006.

Fry AC, Ciroslan D, **Fry MD**, LeRoux CD, **Schilling BK**, and Chiu LZF. Anthropometric and performance variables discriminating elite junior weightlifters. *Journal of Strength and Conditioning Research*, 20: 861-866, 2006.

Fry AC, **Schilling BK**, **Weiss LW**, and Chiu LZF. Beta 2adrenergic receptor downregulation and performance derements during high-intensity resistance exercise overtraining. *Journal of Applied Physiology*, 101:1664-72, 2006.

Lackey N, Enriquez M, Miles MS, Witt J, Gore P. A Pilot Self-Care Group Intervention for Low-Income HIV-Positive Women. *Journal of Health Disparities Research and Practice*. Vol 1, (1):1-18, 2006.

Moore CA, **Weiss LW**, **Schilling BK**, **Fry AC**, and **Li Y**. Acute effects of augmented eccentric loading on jump squat performance. *Journal of Strength and Conditioning Research*, 21:157-162, 2006.

Okwumabua J, Rosato JF, Okwumabua TM, Wong SP. Health promotion trial with mental patients: a community-based partnership. The American Academy of Health Behavior Annual Scientific Meeting. Savannah, Georgia. March 2007.

Santosh K, Ten HL, Posner ME, Sinha P. Optimal sleep wakeup algorithms for barrier coverage in wireless sensor networks. IEEE BROADNETS. 2007.

Brian Schilling (HSS) is waiting for news from the National Parkinson's Foundation (NPF) and the Parkinson's Disease Foundation (PDF), where he has submitted proposals to examine resistance training in persons with Parkinson's Disease.

Paul Wright (HSS) has been invited to submit a full proposal to the W.T. Grant Foundation for a group-randomized trial to test the effectiveness of a theory-based physical activity program on urban high school students' academic outcomes.

Paul Wright also had a book chapter in *Motivation of Exercise and Physical Activity* and two articles (*Perceptual and Motor Skills* and *Journal of Teaching in Physical Education*) accepted for publication and will present at the 4th Annual International Congress on Qualitative Inquiry in Champaign, IL

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Summer is the perfect time to write a grant—let the CCH help!

As you plan for grant submissions, remember that the CCH can provide you with several pre-award services including

- Identifying funding opportunities and collaborators
- Brainstorming and “polishing” proposal ideas
- Statistical consultation for analysis of pilot data,

statistical power calculations, and writing of data analysis plans

- Assistance generating budgets and budget justifications
- Scientific critiquing and technical editing of proposals

When grants that are submitted through the CCH are funded, we also provide

several post-award services including

- Budget management
- Consultation on staff hiring and training, project start-up issues, protocol development, measures selection, and human subjects training
- Assistance preparing progress reports for funders