

# **Abell Endowment Distinguished Lecture in Computer Engineering**

**in conjunction with the  
Electrical and Computer Engineering Department  
and  
Computer Science Department Seminar Series**



## **Dr. Hank Dietz**

Professor and James F. Hardymon Chair in Networking  
Electrical & Computer Engineering Dept.  
University of Kentucky

## **“Cameras as Computational Devices”**

**Monday, April 8, 2013**

Reception: 10:30 a.m.

Lecture: 11:00 – 12:00 noon

Location: Computer Science Building Room 130

## **ABSTRACT**

### **Cameras as Computational Devices**

As electronic sensors replaced film in cameras, not much appeared to change. However, modern digital cameras contain computers. Instead of merely simulating film, the camera can use the sensor and optics to intelligently capture data for more sophisticated processing -- doing things no film camera could. This talk will introduce two very different computational photography concepts that we've been developing. The first is a method by which a commodity camera can be used to capture scene depth data in a single shot. Combining a better understanding of optics with appropriate processing produces images for "3D" viewing, allows refocus after capture, etc. The second concept involves a completely new way of thinking about camera sensors -- in which the sensor itself is a massively-parallel computer constructed using millions of nanocontrollers.

## **SPEAKER BIOGRAPHY**

Upon completing his Ph.D. at Polytechnic University (now NYU-Poly) in 1986, Henry G. (Hank) Dietz joined the Computer Engineering faculty at Purdue University's School of Electrical and Computer Engineering. In 1999, he moved to the University of Kentucky, where he is a Professor of Electrical and Computer Engineering and the James F. Hardyman Chair in Networking. Despite authoring approximately 200 scholarly publications mostly in the fields of compilers and parallel processing, his group is best known for the open source research products it has created: PCCTS/ANTLR compiler tools, Linux PC cluster supercomputing, SWAR (SIMD Within a Register), FNNs (computer-evolved Flat Neighborhood Networks), MOG (MIMD On GPU), etc. Most of his work is freely distributed via [Aggregate.Org](http://Aggregate.Org). Dietz also is an active teacher, and was one of the founders of the EPICS (Engineering Projects In Community Service) program. He is a member of ACM, IEEE, and SPIE.

**To meet with the speaker**, please contact Prof. H.J. Siegel at [HJ@ColoState.edu](mailto:HJ@ColoState.edu).