



THE CHINESE UNIVERSITY OF HONG KONG  
Institute of Network Coding  
and  
Department of Information Engineering  
*Seminar*



## Temporal Psychovisual Modulation: A New Paradigm of Information Display

by

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**Time : 11:00 am - 12:00 pm**  
**Venue : Room 833, Ho Sin Hang Engineering Building**  
**The Chinese University of Hong Kong**

### Abstract

We report on a new paradigm of information display that greatly extends the utility and versatility of current optoelectronic displays. The main innovation is to let a display of high refresh rate optically broadcast so-called atom frames, which are designed through non-negative matrix factorization to form bases for a class of images, and different viewers perceive self-intended images by using display-synchronized viewing devices and their own human visual systems to fuse appropriately weighted atom frames. This work is essentially a scheme of temporal psychovisual modulation (TPVM) in visible spectrum, using an optoelectronic modulator coupled with a biological demodulator. TPVM has a wide range of applications, including digital gaming, 3D TV/movie, virtual reality, scientific/medical visualization, security, etc. This pioneer research is featured in MIT Technology Review, Science News, Spectrum of Physics and other on-line sites.

### Biography

Xiaolin Wu got his B.Sc. from Wuhan University, China in 1982, and Ph.D. from University of Calgary, Canada in 1988, both in computer science. Dr. Wu started his academic career in 1988, and has since been on the faculty of University of Western Ontario, New York Polytechnic University (NYU Poly), and currently McMaster University, where he is a professor at the Department of Electrical & Computer Engineering and holds the NSERC senior industrial research chair in Digital Cinema. His research interests include image processing, multimedia signal coding and communication, joint source-channel coding, multiple description coding, and network-aware visual communication. He has published over two hundred research papers and holds two patents in these fields. Dr. Wu is an IEEE fellow, an associated editor of IEEE Transactions on Image Processing and of the Elsevier journal of Digital Signal Processing. He also served as an associated editor of IEEE Transactions on Multimedia and on the technical committees of many IEEE international conferences/workshops on image processing, multimedia, data compression, and information theory. Dr. Wu received numerous international awards and honors, including Velux Fellowship, Nokia Research Fellowship, Monsteds Fellowship, UWO Distinguished Research Professorship, and the 2008 VCIP best paper award.

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