



# UMass Lowell Computer Science Colloquium Announcement

**Speakers:** Jun-Hong Cui, University of Connecticut  
**Date & Time:** Wednesday, Oct. 4, 2006, 3:00pm--4:00pm  
**Place:** Olsen 311, Refreshments are served at 2:30pm

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## Underwater Sensor Networks: Applications and Challenges

The Earth is a water planet. For decades, there have been significant interests in monitoring aquatic environments for scientific exploration, commercial exploitation and coastline protection. Highly precise, real-time, and temporal-spatial continuous aquatic environment monitoring systems are extremely important for various applications, such as oceanographic data collection, pollution detection, and marine surveillance. However, traditional techniques, such as remote telemetry and sequential local sensing, cannot satisfy these high-demanding application requirements.

Recently, sensor network has emerged as a very powerful technology for many applications, including monitoring, measurement, surveillance and control. The idea of applying sensor networks in underwater environments (i.e., forming underwater sensor networks) has received increasing interests. Even though underwater sensor networks (UWSNs) share some common characteristics with terrestrial sensor networks, such as the large number of nodes and limited energy, UWSNs are significantly different from terrestrial sensor networks in many aspects: low bandwidth capacity, large propagation latency, node float mobility (resulting in high network dynamics), high error probability, and 3-dimensional space. These new features bring many challenges to the design of UWSNs.

In this talk, I will review the unique features of UWSNs and discuss the research issues in UWSN design. Adopting a top-down approach along the layered protocol stack, we roughly go down from the top application layer to the bottom physical layer. At each layer, a set of new design intricacies are identified. I will also take reliable data transfer as an example, and showcase how the new features of UWSN affect the network protocol design.

**Bio:**

Jun-Hong Cui received her B.S. degree in Computer Science from Jilin University, China in 1995, her M.S. degree in Computer Engineering from Chinese Academy of Sciences in 1998, and her Ph.D. degree in Computer Science from UCLA in 2003. Currently, she is an assistant professor in the Computer Science and Engineering Department at University of Connecticut. Her research interests cover the design, modelling, and performance evaluation of networks and distributed systems. Recently, her research mainly focuses on exploiting the spatial properties in the modeling of network topology, network mobility, and group membership, scalable and efficient communication support in overlay and peer-to-peer networks, algorithm and protocol design in underwater sensor networks. At UCONN, she leads UbiNet (Ubiquitous Networking) Lab and UWSN (UnderWater Sensor Network) Lab. She is a member of ACM, ACM SIGCOMM, ACM SIGMOBILE, IEEE, IEEE Computer Society, and IEEE Communications Society. More information on her recent projects and publications is available at <http://www.cse.uconn.edu/~jcui/>.