Dr. Fahmida N. Chowdhury, Program Director, Office of International Science and Engineering, US National Science Foundation.

Dr. Fahmida N. Chowdhury is a Program Director in the Office of International Science and Engineering (OISE) at the US National Science Foundation (NSF). Prior to joining NSF in 2008, she was a Professor of Electrical and Computer Engineering at the University of Louisiana, Lafayette, USA, where she held the W. Hansen Hall and Mary O. Hall Endowed Chair in Computer Engineering. Dr. Chowdhury has been active in IEEE for many years; she served on the editorial boards of two IEEE Transactions: on Control Systems Technology and on Neural Networks. She was an elected member of the IEEE Control System Society's Board of Governors, and also IEEE Computational Intelligence Society's AdCOM. Her research interests include complex systems modeling and analysis, non-traditional applications of dynamic systems theory, and detection of abnormal conditions (faults) in dynamic systems. She has deep interest in international science, technology and educational collaborations, science and engineering diplomacy, and serving society through humanitarian technologies and policy-level engagements.

Lecture topics

1. **Careers at the Rapidly Shifting Human-Technology Frontier: Global Engagement, Local Impact**

The last decade has witnessed some rapid progress in science and technology, and the human-technology frontier has shifted considerably. In this talk, I argue that in the engineering community, career paths in this changed world should include not only technical fields but also administrative fields, entrepreneurship, science and technology education, and very importantly, policy and diplomacy at local, national and international levels. Adopting such a broad viewpoint would open up many interesting and highly satisfactory career paths, and may bring personal and professional fulfillment in unexpected ways. Technical education and training should provide a highly transferable skill-set that can be valuable in many other fields, including that of national and international science and technology policy.

2. **Fault Detection in Dynamic Systems**

Detection of abnormal conditions (faults) in dynamic systems is essential to smooth and stable operation of the system. In this talk, I present the basic ideas of fault detection and fundamental methodologies for detection and management of faulty conditions. Focus is on noisy and uncertain systems. Tools for fault detection include statistical/probabilistic and artificial neural networks combined with traditional estimators/observers. These approaches can be adapted to many different applications. Of particular interest is the issue of fault detection in the presence of fault-tolerant control.