The Advanced Digital Sciences Center research project, ReCognize: Reliable Cognitive Radio Networks for the Smart Grid Project, is working to create reliable, efficient, adaptable and low-cost method of communication between smart appliances and energy management systems. It is a functional block that helps provide smart grid security at the lowest communication layer by providing an enabling communication platform on which tomorrow’s smart grid can operate reliably.

The ReCognize project makes three major research contributions including providing a cognitive radio protocol, a test bed for evaluating performance in a real smart home environment and the design of interface avoidance schemes that target predictable, oblivious behavior. ReCognize aims to develop attack models that will predict worse case scenarios in smart grid networks.

Today’s wireless communication networks are already congested, and there may not be enough free spectrum set aside for tomorrow’s smart grid networks. ADSC researchers are working to solve this problem by reliably detecting whether there are licensed users on a certain frequency band, even when there is noise. This enables them to take advantage of open networks, which will reduce the network congestion. Additionally, once appliances and networks are able to communicate with each other, electronics may fail with potentially unpredictable misbehaviors, such as breaking or sending an incorrect message across the network. The ReCognize project is working to deliver consistent performance even when various electronic appliances on a network may suffer from malfunctions and stop cooperating with each other.

About Us
The Advanced Digital Sciences Center is a University of Illinois at Urbana-Champaign research center in Singapore, led by Illinois Computer Science and Electrical and Computer Engineering faculty members. ADSC’s research aims to transform the way people use and interact with information technologies, through research in interactive digital media and the smart grid. ADSC is funded by the Agency for Science, Technology, and Research (A*STAR).