**Performed Activities and Outcomes**

**Activity 1: Visit of Dr. Narayan Mandayam to the University of Miami**

The first activity of this SEED project involved the visit of Dr. Narayan Mandayam, from Rutgers University, to the group of Dr. Saad at the University of Miami on 04/22/2014 and 04/23/2014. The visit took place over two days. In the first day, Dr. Mandayam attended a suite of small talks by Dr. Saad’s students who presented their work to Dr. Mandayam. Dr. Mandayam provided important feedback particularly on the work of Yunpeng Wang, Dr. Saad’s student who is now constantly collaborating with Dr. Mandayam on the area of mechanism design for smart grid.

On this day, Dr. Saad and Dr. Mandayam also worked together on two fronts: 1) outlining a plan for upcoming proposal submissions and 2) generating a new model with preliminary simulation results on the topic of smart grid optimization.

On the second day, Dr. Mandayam gave a seminar which was also attended by several ECE faculty as well as faculty from FIU. The seminar provided an overview on a recently emerging research topic – security in collaborative systems such as Wikipedia.

**Outcomes:** The key outcomes of this activity included:

1. Generation of new results on smart grid research which served as a pre-cursor to an NSF proposal submission between Drs. Saad and Mandayam, on this joint topic.
2. Initiation of a joint collaboration between Dr. Saad, Dr. Mandayam, and Dr. Saad’s student Yunpeng Wang. Yunpeng is now constantly working with Dr. Mandayam in a number of upcoming papers.
3. Drs. Saad and Mandayam submitted a white paper to the Air Force Research Lab (AFRL) in August 2014, on a topic related to security, which was discussed during Dr. Mandayam’s visit.
4. Drs. Saad and Mandayam are now working towards a third proposal submission to NSF’s cyber-physical systems program, due in December 2014.
5. Overall, the visit provided Dr. Saad with a new collaboration with a leading expert in the field of communications and mechanism design, and this collaboration will largely be long-term.

**Activity 2: Visit of Dr. Saad to New York University**

The second activity of this SEED project involved the visit of Dr. Saad to New York University to work with Dr. Quanyan Zhu, an Assistant Professor in Electrical and Computer Engineering between 08/03/2014 and 08/06/2014. During this visit, Dr. Saad worked with Dr. Zhu on preparing new research problems related to the area of wireless security. In particular, Dr. Saad worked thoroughly with Dr. Zhu on developing new mathematical models for the security of sensor-enabled systems such as the Internet of things (IoT) that utilize both their expertise: Dr. Saad’s expertise in game theory and Dr. Zhu’s expertise in control theory. These models will
serve as a basis to submit a proposal for NSF in January 2014, on the topic of control theoretic analysis of IoT security.

In addition, Dr. Saad interacted with a number of faculty and students at NYU, which will help build a new two-way relationship between the two Universities. In fact, Dr. Saad is also currently interacting further with one of those faculty for a possible proposal submission.

**Outcomes:** The key outcomes of this activity included:

1. Generation of new results on the security of sensor-enabled IoT networks that combine the expertise of the two PIs.
2. Preparation for submitting a proposal to NSF during January on the aforementioned topic.
3. Drs. Saad and Zhu are now discussing the possibility of having some short-term visits for their current PhD student.
4. Overall, the visit provided Dr. Saad with new possibilities for collaboration with NYU, particularly with the control group as well as with other colleges and departments, such as the department of technology management and innovation.