

**Professional Development Grant 2017-2018**

**Final Report**

**A. Title Page**

Tutorial on 2018 IEEE Annual Green Technologies Conference

April 4-6, 2018

Austin, Texas

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## **B. Restatement of professional enhancement opportunity**

Tutorial: Application of Internet of Things (IoT) for Machine Condition and Environmental Monitoring; Low-Power Wide-Area Network Technology for Internet of Things

Conference: 2018 IEEE Annual Green Technologies Conference

Date: April 4-6, 2018

## **C. Brief review of the professional enhancement opportunity**

The tutorial began with an overview of IoT. The case studies on IoT applications in machine condition monitoring and water quality monitoring system were presented in detail. The approach to develop IoT applications was presented. Dr. Wu also demonstrated an IoT application for environmental data logging using LoRa (Long Range) wireless data communication technology. Figure 1 shows a few of the PowerPoint slides used in this tutorial. In the Q&A session, we interacted with the audience, solicited their input and facilitated the discussion on presented case studies. The detailed schedule of the tutorial is given in Table 1.

Table 1: Detailed Schedule of the Tutorial

<b>Activity</b>	<b>Duration (minutes)</b>
Introduction	10
IoT Application Case Study 1: Machine Condition Monitoring	15
IoT Application Case Study 2: Water Quality Monitoring of Lake Dardanelle, AR	15
IoT Application Development	15
Demonstration	15
Question and Answer Session	20
<b>Total Duration</b>	<b>90</b>

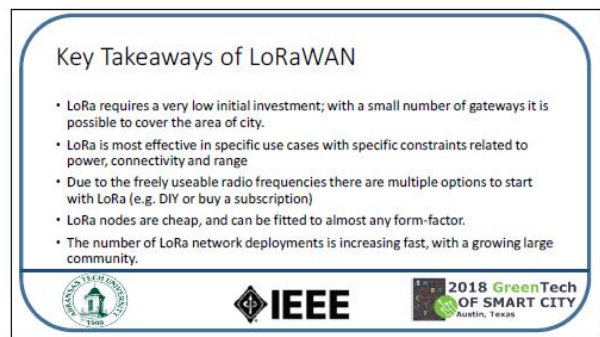
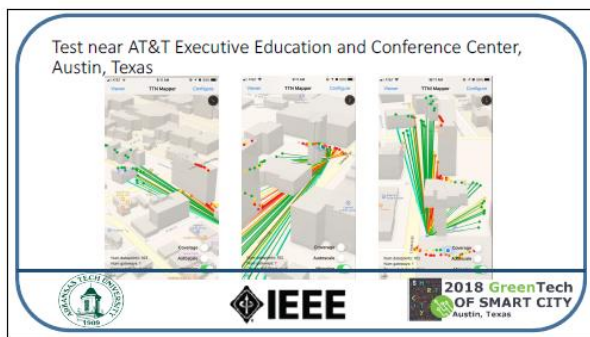
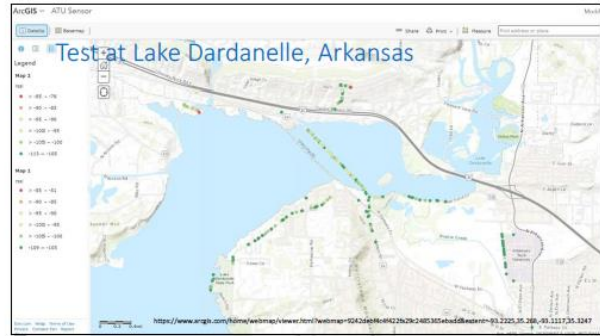
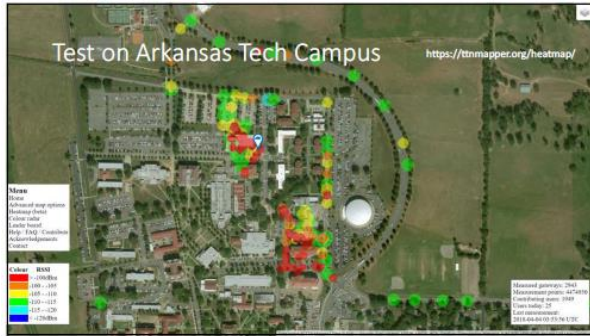


Figure 1. Sample PowerPoint Slides of the Tutorial

**D. Summary of findings, outcomes, or experiences**

This tutorial is designed to appeal to a diverse group of participants including students, faculty, industry professionals, policymakers and practicing engineers who would like to develop a deeper understanding of IoT based applications and complexities involved in the development of those applications. Attending the conference enhanced the professional network of Arkansas Tech University (ATU). Bringing my expertise to the conference is an important avenue to showcase ATU’s research activities. The conference and tutorial are successful in communicating my ideas with the professional audience and expanding network in the research area.

**E. Conclusions and recommendations**

In addition to presenting the research to the professional audience at the conference, part of this research have been used on one of the current student senior design projects (Spring 2018

and Fall 2018). A presentation has been given on a meeting of the student section of IEEE Arkansas River Valley Section. Furthermore, the research results will be published in IEEE SoutheastCon 2019.