Introduction to Internet of Things (2015 Fall at Nanjing University)

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1 Introduction

A graduate level course provided for master and PhD students at Nanjing University, Nanjing, China.

2 Instructor

Prof. Lei Xie (`http://cs.nju.edu.cn/lxie/`)

3 My Score

89 / 100

4 Syllabus

1. **Introduction to Introduction of Things**
2. **Radio Frequency Identification**
   Automatic identification technology
   The history and current development of RFID
   The principle of RFID system
   RFID tag conflict and anti-conflict algorithm
   The relationship between RFID and the IOT
3. **Radio Transmission**
   Radio transmission mechanism
   Antenna and antenna gain
   Path loss model
   Multi-path effect and Doppler effect
4. **Sensor Networks**
   Background, application and structure of wireless sensor networks
   The hardware platform and operating system of the sensor node
   The difference and connection between wireless sensor networks and mobile networks
   Typical MAC layer protocol and protocol design ideas in wireless sensor networks
   Topology control principles and representative protocols in wireless sensor networks

Energy efficiency issues in wireless sensor networks

Energy-efficient routing method in wireless sensor networks

Principle and method of node location in wireless sensor networks

5. **Positioning system basis**

   Current popular positioning systems

   Various positioning technology principles

   The Challenge and Development of Positioning Technology in the IOT Environment

6. **Intelligent information device**

   Overview of smart device

   The operating platform of the smart device

   New trends in the development of smart devices

7. **Wireless low-speed network**

   Why we need wireless low-speed networks?

   Current low-speed network protocol

   Low-speed network and interconnection principle

8. **Mobile internet**

   Intelligent mobile internet

   Crowdfunding network

   Mobile internet computing

9. **Information Security and Privacy Protection in IOT**

   General evaluation of network information security

   RFID security privacy issues and protection;

   Location information and personal privacy issues and protection

10. **Applications of IOT**

    Smart power grid

    Intelligent transportation

    Intelligent building

    Environment protection