Electrical Communications Systems

09433

Course Project

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What do we need for this project ?

- Focused research in one of the topics on communication
- 15 min Final presentation 5min Q&A, Academic conference level
- Course paper, Academic Publication level, using template from IEEE
- Search and read scientific journal and conference paper, think innovative ideas
- Tell a story

What do we need for this project ?

- Introduce the background
- Formulate a problem
  - Identify the relevant constraints and formulate the problem as a research
- Propose solutions
  - Propose and implement solutions for the problem identified, making sure that all constraints are met
- Assess the solutions
  - assess your own solution in terms of real-world feasibility and applicability

Topics

- Cyber physical systems
- Cloud computing
- Communication between or within data centers
- LTE and 5G wireless networks
- Communication network security
- The onion routing network (Tor) network
- Privacy in communication network
- Cognitive Radio
- Radio of fiber
- Wireless sensor networks
- New techniques in optical communication
- Space-division multiplexing in optical fibers
- Quantum communication
- Free-space optical communication or LiFi
- Novel communication devices
- Communication entrepreneur

Cyber Physical Systems

- Why it become so important in the past 5 years?
- What techniques are the key points for cyber physical systems (wireless sensor network, embedded system, wireless communication, microcell wireless network, big data, data center, security)
- What limit the application of cyber physical system?
- Commercial needs, potential customer

Tor network

- When was it first proposed? Who proposed it?
- Which groups are the leading groups?
- What new techniques has been made since it was first proposed? (Defend and Attack)

Free-space Optical Communication

- Limitation, Power
- Solutions
- Application

Topics

- Cyber physical systems
- Cloud computing (security, capacity)
- Communication between or within data centers (RF cable, integration, all optical switching,)
- LTE and 5G wireless networks (Potential standard for 5G, carrier frequency)
- Communication network security
- The onion routing network (Tor) network (Defend and attack, traffic analysis attack)
- Privacy in communication network (Privacy in social media network, facebook)
- Cognitive Radio

Topics

- Radio of fiber (Bandwidth, application)
- Wireless sensor networks (application)
- New techniques in optical communication
- Space-division multiplexing in optical fibers (Mode coupling, fiber coupling, micro fabrication)
- Quantum communication (Security)
- Free-space optical communication or LiFi (Limitation, application)
- Novel communication devices (antenna, optical transmitter/ receiver, nano/micro devices) (Micro and Nano Fabrication techniques)
- Communication entrepreneurship