

## **INFORMATION PAGE ABOUT THESIS'S ACADEMIC CONTRIBUTION**

- Thesis: *New P-LDPC encoding/decoding algorithms to improve the performance of LS-MIMO system*
- Specialization: Telecommunications Engineering
- Code: 9.52.02.08
- Ph.D. Candidate: VU DUC HIEU
- Supervisors:
  1. Dr. NGUYEN VAN THUY
  2. Prof. Dr. NGUYEN HONG QUANG
- Institution: Posts and Telecommunication Institute of Technology

### **CONTRIBUTIONS OF THE THISIS**

1. The thesis proposes the belief propagation detector for large-scale multiple-input multiple-out communication systems where the low-resolution analog-to-digital converters (ADCs) are used to save the power.
2. The thesis proposes the joint MIMO detection and LDPC decoding graph where the mutual information fuctions of messages are passed. This joint graph plays a vital role in the optimization process of designing new protograph LDPC codes, tailored for LS-MIMO communications systems.
3. The thesis develops an analytical tool to investigate the impact of the low-resolution ADCs as well as to provide the engineering insights for the protograph LDPC code design and evaluation in LS-MIMO systems.

### **APPLICATION AND USED IN THE REAL WORLD OR FUTURE WORKS**

The practical implication of this study is that the proposed performance evaluation tools and coding design algorithms will help mobile link designers to architect good protograph LDPC codes and the optimal low-resolution ADC converter for the multiple input multiple output communication systems.

**Supervisor**

**Ph. D. Candidate**

Dr. NGUYEN VAN THUY

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