

## SUMMARY OF PHD DISSERTATION

Dissertation Title: Spectral graph methods in some of additive combinatorics problems

Speciality: Mathematical foundation for computer science.

Speciality code: 9 46 01 10

PhD student: Do Duy Hieu

Supervisor: Assoc. Prof. PhD. Le Anh Vinh

Training Institute: Institute of Mathematics, Vietnam Academy of Science and Technology

This thesis is devoted to study the cardinality of some sets on vector space in finite fields and finite rings: two- variable Expanders, distance sets and product sets, sum – ratio sets, distance sets on regular varieties and volume set of boxes.

### **The main results of the thesis include:**

- We study and improve some results of distance sets and product sets.
- We study and improve some results of volume set of boxes in vector space in finite fields and finite rings.
- We study two-variable Expanders in finite fields and finite rings:  
 $A(A+1), A+A^2$ .
- We study and generalize some results of the sum – ratio sets.
- We study and give the general result for distance sets of a set in regular variety.

*Supervisor April 10, 2019*

PhD student

**Le Anh Vinh**

**Do Duy Hieu**