INFORMATION ON DOCTORAL THESIS

1. Full name: Lê Hồng Anh  
2. Sex: Male  
3. Date of birth: 17/10/1980  
4. Place of birth: Vĩnh Phúc  
5. Admission decision number: 3205/QĐ-DT  
   Dated: 08/11/2010  
6. Changes in academic process:  
   Changed thesis title to “Methods for modeling and verifying event-driven systems”, decision number 34/QĐ-DT, signed date: 18/01/2013  
8. Major: Software Engineering  
9. Code: 62.48.01.03  
10. Supervisors:  
   Assoc. Prof. Trường Ninh Thuận, Assoc Prof. Phạm Bảo Sơn  
11. Summary of the new findings of the thesis:  

1. This thesis introduces a new method to model and verify a database system with triggers by using Event-B. This approach provides detailed steps to translate database concepts to Event-B notations. The translation is based on the similarity between triggers, which has the form of ECA rules, and Event-B events. The method reduces cost of development because it can detect errors at early design phase and it is easy to apply in practice. A tool partly supports for transforming a database systems with triggers is also developed.  
2. The thesis continues investigating the benefit of similar acts between ECA rules and Event-B event to propose a method to model and verify context-aware systems. Furthermore, the thesis recognizes the advantages of Event-B refinement mechanism to make proposed methods suitable for incremental modeling. Significant properties are defined as invariants and can be checked automatically using the supporting tool Rodin.  
3. We handle the case that a system is described by imprecise requirements. Its behavior rules are now specified in the form of Fuzzy If-Then rules. The thesis introduce a new representation of fuzzy terms by classical sets and present a set of rules to translate Fuzzy If-Then rules to Event-B constructs. We
also make an extension by introducing timed Fuzzy If-Then rules to model a timed system.

4. The thesis makes use of Event-B refinement and some existing reasoning methods to analyse some significant properties of imprecise system requirements such as safety and eventuality properties.

12. Practical applicability, if any:

The result of the thesis can be used in real software development process, especially for event-driven systems.

13. Further research directions, if any:

The future work of the thesis is developing new methods based on Event-B for modeling and verifying time-constraint properties. New supporting tools are also developed for automatical modeling.

14. Thesis-related publications: