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Formalization and Verification of Group Behavior Interactions

Indurthi Ravindra Kumar & B.Harish Goud
[1]Assistant Professor, Dept. of IT,JB INSTITUTE OF Engineering and Technology. Moinabad,
Mail Id: - indurthiravindrakumar@gmail.com
[2]Assistant professor, Dept. of IT,JB INSTITUTE OF Engineering and Technology, Moinabad,
Mail Id: -bhg120109@gmail.com

Abstract

Group behavior interactions, such as multirobot teamwork and group communications in social networks, are widely seen in both natural, social, and artificial behavior-related applications. Behavior interactions in a group are often associated with varying coupling relationships, for instance, conjunction or disjunction. Such coupling relationships challenge existing behavior representation methods, because they involve multiple behaviors from different actors, constraints on the interactions, and behavior evolution. In addition, the quality of behavior interactions are not checked through verification techniques. In this paper, we propose an ontology-based behavior modeling and checking system (OntoB for short) to explicitly represent and verify complex behavior relationships, aggregations, and constraints. The OntoB system provides both a visual behavior model and an abstract behavior tuple to capture behavioral elements, as well as building blocks. It formalizes various intra-coupled interactions (behaviors conducted by the same actor) via transition systems (TSs), and inter-coupled behavior aggregations (behaviors conducted by different actors) from temporal, inferential, and party-based perspectives. OntoB converts a behavior-oriented application into a TS and temporal logic formulas for further verification and refinement. We demonstrate and evaluate the effectiveness of the OntoB in modeling multirobot behaviors and their interactions in the Robocup soccer competition game. We show, that the OntoB system can effectively model complex behavior interactions, verify and refine the modeling of complex group behavior interactions in a sound manner.

Key words: - Legal Requirements, Algebraic Computation, Use Case Maps,Basic Protocols, Symbolic Modeling.

1. INTRODUCTION

Behavior refers to the action or reaction of any material under given circumstances and environment. It is intrinsic in many areas, and behavior analysis has become a fundamental topic which has been increasingly investigated as an essential activity in many fields, from social and behavioral sciences to computer science [1], [2]. In Google, the keyword "behavior" attracts 379 000 000 hits while "behavior interaction" achieves 202 000 000 results, searched on 4th Dec. 2014. In both natural and social sciences and applications, multiple behaviors from one or multiple actors often interact with one another, which are called coupled behaviors or group behavior interactions. They play important roles in group-based activities such as social networking and multirobot teamwork. These coupled behaviors and behavior interactions may form interior driving forces that shape underlying businesses, such as in online community and social networks [3], or may even cause challenging problems like group-based manipulation by a group of traders [4] or serious traffic jams resulting from haphazard interactions between vehicles traveling in different directions toward an intersection. With the deepening and widening of complex networking, coupled behaviors, or group behavior interactions are increasingly seen in both mainstream and emerging situations, in particular, in enterprise applications, organizations, complex systems, online, and social communities.

2.RELEGATED WORK

2.1Existing System

Existing system focus on revealing the explicit description of the behavior elements in a visual way. Example is Multi robot soccer game.

2.2Proposed System

It introduces an abstract behavior model by specifying the concepts and relationships involved.Further we propose a formal behavior model to represent the various relationships based on Ontology specification.

3.IMPLEMENTATION

3.1Behavior Module:

1.Actor(producer) : Actor module is refered to the new object to the social structure in open message to all over the world visit to our product.

Ex: Organizations , departments.

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2.Operation Module : Operation represents activities , actions or events in a behavior or behavior sequence.

3.Coupling Module : Coupling refers to interaction between behaviors , including connections between actors or operations

3.2User Module:

- Mainly accepted the overall behavior model.
- works for all the product details and related comments view.

4.EXPERIMENTAL RESULTS

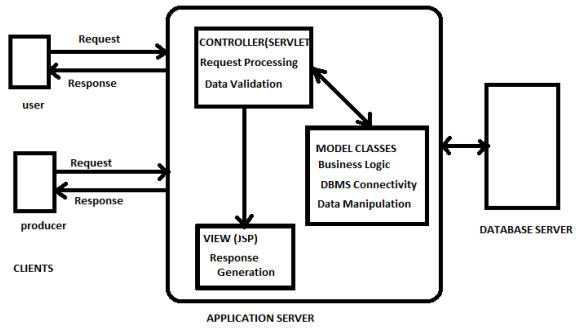

Fig 1 Architecture Diagram

Fig 2 Registration Page

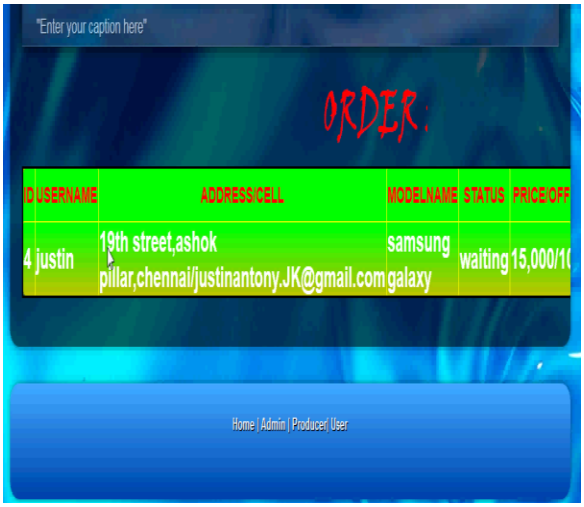

Fig 3 User Orders Page

Fig 4Product descriptionPage

Fig 5Product details Page

5.CONCLUSION

It work on behavior to systematically and flexibly address the concept of couple

behaviors in a solid and generic manner.Context-sensitive coupled behaviors are worth exploring and investigating.Opportunity in many aspects such as representing, checking, reasoning, learning behavior couplings.

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