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Agent Communication in Dynamic Belief Update

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Abstract

Thus far, various formalizations of rational/logical agent model have been proposed. In this paper, we include the notion of communication channel and belief modality into update logic, and introduce Belief Update Logic (BUL). First, we discuss that how we can reformalize the *inform* action of FIPA-ACL into communication channel, which represents a connection between agents. Thus, our agents can send a message only when they believe, and also there actually is, a channel between him/her and a receiver. Then, we present a static belief logic (BL) and show its soundness and completeness. Next, we develop the logic to BUL, which can update Kripke model by the inform action; in which we show that in the updated model the belief operator also satisfies K45. Thereafter, we show that every sentence in BUL can be translated into BL; thus, we can contend that BUL is also sound and complete. Furthermore, we restrict the usage of logic, provided the prerequisite condition for sender as well as the expected belief state of receiver. Finally, we discuss some future issues.

Key Words: **Belief Update Logic, Agent Communication, Communication Channel**