

2. ARNOR

Arnor is a four-step method that guides developers to systematically engineer SIPA’s social experience. Arnor’s steps include modeling: (1) goals, (2) social contexts, (3) social expectations, and (4) social experience.

Goal modeling enables a SIPA to be aware of its stakeholders, their goals, and relevant plans. Arnor uses Xipho [6] constructs for goal modeling.

Context modeling includes identifying social contexts in which stakeholders of a SIPA interact. The context plays a decisive role in which goals to bring about or which plans to execute during inconsistencies.

Social expectation modeling includes identifying norms and sanctions that govern stakeholders’ goals and plans.

Social experience modeling includes identifying SIPA’s actions that promote greater social experience, i.e, choosing which plans to execute, which goal states to accomplish, and which norms to satisfy.

2.1 Evaluation

We evaluate Arnor (A) against Xipho (X), an existing AOSE method, via a developer study in which 30 developers engineer ringer manager SIPAs, and simulation experiments under various adaptation environments on the SIPAs engineered during the developer study. We use Xipho as our baseline method because it is best suited among the existing AOSE methods to engineer personal agents. Refer our AAMAS’17 paper [1] for details.

Developer Study. We hypothesize that the developers who follow Arnor (1) produce better models, (2) expend less time, (3) feel it is easier to develop a SIPA, and (4) expend less effort, than those who follow Xipho. We find that developers using Arnor spend less time and effort, and overall feel it is easier to engineer a SIPA using Arnor. No significant difference is found in the model quality. Figure 1 summarizes the time and effort results.

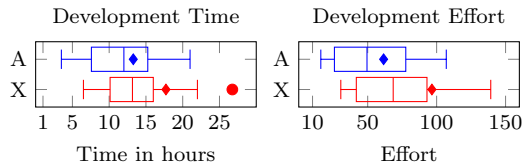


Figure 1: Development time and effort.

Simulation Experiments. We hypothesize that SIPAs developed using Arnor (1) have better adaptability features, and (2) provide richer social experience, than SIPAs developed using Xipho. We measure social experience via norm compliance and sanction proportion measures. We find that SIPAs engineered using Arnor have greater adaptability correctness, similar norm compliance, and are prone to lesser sanctions. Figure 2 summarizes the simulation results for sanction proportion in various adaptation environments.

3. ONGOING AND FUTURE DIRECTIONS

One, when norms conflict, SIPAs must execute actions that promote richer social experience. How can we develop computational support over Arnor to recommend actions?

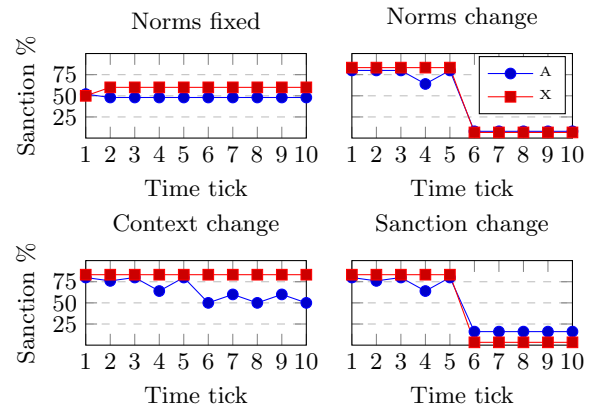


Figure 2: Arnor versus Xipho’s sanction proportion.

Two, when SIPAs satisfy or violate norms, they might share certain contextual information related to satisfaction or violation. Social experience largely depends on how SIPAs’ stakeholders perceive shared information. How and what contextual information should a SIPA disclose?

Three, an understanding of emotions and affect could assist SIPAs in learning contextually relevant norms. How can we incorporate an affective and emotional basis of social norms in SIPAs?

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