

# Errata for the PhD thesis “New Directions in Model Checking Dynamic Epistemic Logic”

Malvin Gattinger (malvin@w4eg.eu)

Last update of this file: May 16, 2024. For the latest version, see <https://malv.in/phdthesis/>.

## Chapter 1

- On page 22, in Figure 1.3 the action names  $\alpha$  and  $\beta$  should be removed and the arrow between them should have the label “Bob” without italics.
- On page 33, Fact 1.8.9 also contains the *definition* of  $\Phi(R)$ .
- On page 33, the Figures 1.8 and 1.9 match to each other, but not to Figure 1.10. The latter contains a wrong BDD which does not correctly encode the function given by the formula in Figure 1.9. The BDD in Figure 1.10 is the one from [GR02, p. 136] and it encodes a different relation, where (compared to Figure 1.8) there is *no* edge from  $\emptyset$  to  $\{p_1, p_2\}$ , but there *is* an edge from  $\{p_2\}$  to  $\{p_1, p_2\}$ .

## Chapter 2

- On page 52, in Definition 2.5.1 the term  $\|\theta^+\|_{\mathcal{F}}$  is undefined. To repair this, Definition 2.2.6 should be extended to  $\mathcal{L}(U)$  where  $U \supseteq V$ . We then get  $\|q\|_{\mathcal{F}} = q$  for all  $q \in V^+$ .

The implementation of Definition 2.2.6  $\phi \mapsto \|\phi\|_{\mathcal{F}}$  in fact does this already, see Figure 3.8: The atomic case in line 3 does not depend on the knowledge structure or its vocabulary. Only the knowledge case in line 6 to 8 uses the vocabulary in the variable `allprops` that has to be  $V$ , not  $V^+$ .

- On page 63, Definition 2.7.1 says  $\Omega_i^+ \in \mathcal{L}_B(V \cup V^+)$  but should say  $\Omega_i^+ \in \mathcal{L}_B(V^+ \cup V^{+'})$ , similar to the more general Definition 2.8.2 on page 64.
- On page 77, in Lemma 2.11.2 the last two formulas should contain  $\beta$  instead of  $\beta'$ . In the S5 setting no copy of the vocabulary is needed to describe epistemic relations. The boolean quantifiers here work directly on the vocabularies  $V$  and  $V^*$ . Given that  $\beta$  is already using the joint vocabulary, no prime is needed here.

## Chapter 6

- The epistemic relation  $\sim_i^P$  is not an equivalence relation, because it is not reflexive — as discussed in the bottom of page 167. Hence the word “equivalence” should be removed on pages 166 and 167 in Definition 6.3.5 and 6.3.7 as well as the surrounding text.

This has been corrected in the published version of the manuscript [Dit+18]: Hans van Ditmarsch, Malvin Gattinger, Louwe B. Kuijer, Pere Pardo: *Strengthening Gossip Protocols*

using *Protocol-Dependent Knowledge*, Journal of Applied Logics, Volume 6, Number 1, pp. 157-203, 2019. <https://arxiv.org/abs/1907.12321>.

- On page 194, in the definition of  $\mathcal{F}_{\text{init}}$ , the atomic proposition  $S_{i,j}$  should be  $S_i.j$ .  
Similarly, on page 195 the notation in Figure 6.5 needs to be adjusted.
- On page 195, in line 8 directly above Figure 6.5, the formula  $\theta(S_01)$  should be  $\theta_-(S_01)$ .
- On page 195, in Figure 6.5 the line  $O^+ = \{q_{i,k}\} \cup \{q_{k,i}\}$  should be  $\{q_{i,k} \mid i \in I\} \cup \{q_{k,i} \mid i \in I\}$ .
- On page 195, in the third line after Figure 6.5  $\mathcal{X}_{ab}$  should be  $\mathcal{X}_{\text{call}}$ .
- On page 196 in the caption of Figure 6.7  $\mathcal{X}_{ab}$  should be  $\mathcal{X}_{\text{call}}$ .

## Thank You!

If you find other mistakes, please let me know: [malvin@w4eg.eu](mailto:malvin@w4eg.eu).

I would like to thank the following people for pointing out errors in my thesis:

- Emma Brakkee
- Hans van Ditmarsch
- students of *Functional Programming for Logicians* in 2022
- Daniel Miedema
- students of *Functional Programming* in 2024