

MODAL LOGICS & DYNAMIC EPISTEMIC LOGICS

Modal logics provide a very general logical framework for reasoning about seemingly meta-level notions like “*knowledge*”, “*belief*”, “*provability*”, “*certainty*”. At the basic level, modal logics are extensions of propositional logic that add structured relationships between different propositional assignments, and give controlled access to this extra structure through specific modes of quantification.

In this seminar we want to review the basic set-up for modal logics and then investigate

- classical model-theoretic features of modal logics, in particular: the role of *bisimulation invariance*;
- more recent extensions of the basic set-up geared towards dynamic epistemic concerns (i.e., towards reasoning about distributed knowledge in a dynamic setting).

Among other sources to be considered, here are some textbook sources:

Blackburn, de Rijke, Venema: Modal Logic.
Goranko, Otto: Model Theory of Modal Logic (in Blackburn, van Benthem, Wolter (eds): Handbook of Modal Logic)
van Ditmarsch, van der Hoek, Kooi: Dynamic Epistemic Logic

Other sources (in particular journal articles devoted to more specific topics) will be made available in due course. It is envisaged that up to 10 participants present small thematic units from the above books and/or other sources, probably in the format of a concentrated block seminar session towards the end of the teaching term. Besides the oral presentation, a handout and written summary are typically required. The seminar is available at Bachelor and Master levels.

For the further planning of the seminar and schedule it is essential that, apart from registration in TUCaN, prospective participants contact me as soon as possible: otto@mathematik.tu-darmstadt.de

A first meeting for organisational purposes will be scheduled around the start of the teaching term.