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## Discrete Linear Temporal Logic with Current Time Point Clusters

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Diverse variations of linear temporal logics, as special bi-modal logics, were studied very profoundly. Though, even nowadays there are not investigated pathways. Only recently [3] it has been shown that all finitely axiomatizable linear tense logics are decidable and coNP-complete. We study temporal logic  $\mathcal{TL}(N_C, \Box_w^{+-})$  based on linear time with current time point clusters (bi-modal clusters situated in place of natural numbers imitating time flow). Its language uses, together with standard modalities  $\Diamond^+$  (possible in future) and  $\Diamond^-$  (possible in past), special temporal operations,  $\neg \Box_w^+$  (weakly necessary in future) and  $\Box_w^-$  (weakly necessary in past). Continuing [3], we first show that the logic  $\mathcal{TL}(N_C, \Box_w^{+-})$  itself is decidable.

We propose an deciding algorithm based on reduction of formulas to rules and converting rules in special reduced normal form, and (then) on checking validity of such rules in models of single-exponential size in reduced forms. Then we show how to reduce in  $\mathcal{TL}(N_C, \Box_w^{+-})$  the admissibility problem of inference rules to the decidability of  $\mathcal{TL}(N_C, \Box_w^{+-})$  itself. So, we prove that the admissibility problem for  $\mathcal{TL}(N_C, \Box_w^{+-})$  is also decidable. This fact (based on checking validity of inference rules and presence of a definable universal modality) extends previous results [1,2].

### REFERENCES

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