

# Normative Reasoning - Dyadic Deontic logic of Carmo & Jones

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January 18, 2020

## Abstract

During this talk one more topic on Normative Reasoning, namely Dyadic Deontic logic of Carmo & Jones (**DDL** later on), will be presented. Firstly, we will try to give a feeling and intuition with some examples that motivates the definition of **DDL**, or Contrary-to-Duties, presenting some new **DDL** operators and applying them to those examples as done in [1]. After, the formal language will be defined followed by Semantics section alongside with explanations of different parts of the constructed **DDL** model. To continue, we axiomatize logic adding inference rules as well and at the end present some results concerning soundness and consistency mostly following [1]. Presumably, we pointing out the implementation of **DDL** in HOL relying on [2].

## 1 Introduction

(Taking that the talk will last 30 mins overall. Otherwise I will merely squeeze the talk proportionally). In the first part of the talk I will speak about the reasons of searching the **DDL** instead of Standard Deontic Logic with examples of paradoxes dealing only with those problems not concerning conditional obligations, then I mention the later issues (rapidly saying about Crisholm's paradox. (approx. 5 mins)

## 2 Contrary-to-Duties scenario

This part will start developing **DDL** through the Dog and Warning Sign example and connecting it to some formal parts of the logic and which conclusions we can make with this logic for the given scenario. (approx. 10 mins)

## 3 Technical part

### 3.1 Formal language

Now comes the formal constructions of **DDL** starting with the language itself.  
(approx. 2 mins)

### 3.2 Semantics

Next the models of **DDL** are defined and explained what are the parts of it with some intuitions and explanations. (approx. 5 mins)

### 3.3 ???Axioms and Inference Rules

For now I am deciding how to include this part into the presentation due to its size and want to talk concerning it with somebody to get a feedback but willing to say something about this part. (approx. 2-5 mins)

### 3.4 Soundness and Consistency

Here we just say the results of Soundness and Consistency of constructed logic.  
(approx. 2 mins with conclusions)

## References

- [1] JOSE M. C. L. M. CARMO and ANDREW J. I. JONES. Completeness and decidability results for a logic of contrary-to-duty conditionals. In *Journal of Logic and Computation Advance Access* published April 26, 2012
- [2] CHRISTOPH BENZMÜLLER, ALI FARJAMI, XAVIER PARENT. A Dyadic Deontic Logic in HOL. In *Journal of Applied Logics — IFCoLog Journal of Logics and their Applications*.
- [3] JOSE M. C. L. M. CARMO and ANDREW J. I. JONES. Deontic logic and Contrary-to-Duties. In *Handbook of Philosophical logic* Volume 8, pages 265-343, 2002.
- [4] BRIAN F. CHELLAS. Modal Logic - An Introduction. *Cambridge University Press*, 1980.
- [5] CARLOS E. ALCHOURRON. Philosophical foundations of deontic logic and the logic of defeasible conditionals. In *Deontic Logic in Computer Science: Normative System Specification*, pages 43-84, 1993.