Re: Tautologies Then and Now

Source: http://sci.tech−archive.net/Archive/sci.math/2004−12/6422.html

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From: Stephen Harris (*cyberguard1048−usenet_at_yahoo.com*)
Date: 12/09/04

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Date: Thu, 09 Dec 2004 07:49:46 GMT
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"Stephen Harris" <cyberguard1048−usenet@yahoo.com> wrote in message
news:AcTtd.40421$6q2.21793@newssvr14.news.prodigy.com...
*>
>>> "paul" <paul8801@on−ramp.nl> wrote in message
>>> news:r58er0t5vm620c96lubbut8noob43023ue@4ax.com...
>>>> On Tue, 07 Dec 2004 23:58:40 GMT, "Stephen Harris"
>>>> <cyberguard1048−usenet@yahoo.com> wrote:
>>>>
>>> I think you are right about truth tables (unless there is something
>>> technical),
>
> There appears to be "truth functional proxies".
>
>> For tautologies there is a general method for showing intrinsic truth,
>> a truth table. There is no general method for showing the intrinsic
>> truth of valid statements. A general algorithm for proving a formula to
>> be valid is not possible. But I'm wondering if in a particular class of
>> cases, if there is a specific algorithm for proving formulae to be valid,
>> which would function in principle like a constrained truth table.
>
> Truth functional proxies.
>
>>
>
> As to using logic for reasoning about natural language and common sense.
>
> Talking about Trees and Truth−conditions
> Reinhard Muskens http://www.illc.uva.nl/j50/contribs/muskens/muskens.pdf
> Abstract
> "An attractive way to model the relation between an underspecified
> syntactic representation and its completions is to let the underspecified
> representation correspond to a logical description and the completions to
> the models of that description. This approach, which underlies the
> Description Theory of (Marcus et al. 1983) was integrated with a pure
> unification approach to Lexicalized Tree−Adjoining Grammars (Joshi et al.
> 1975, Schabes 1990) in (Vijay−Shanker 1992) and was further developed in
> the `D−Tree Grammars' (DTG) of (Rambow et al. 1995). We generalize*

> *Description Theory by integrating semantic information, that is, we*
> *propose*
> *to tackle both syntactic and semantic underspecification using*
> *descriptions.*
> *Our focus will be on underspecification of scope. We use a generalized and*
> *completely declarative version of the D−Tree formalism. Although trees in*
> *our set−up have surface strings at their leaves and are in fact very close*
> *to ordinary surface trees, there is also a strong connection with the*
> *Logical*
> *Forms (LFs) of (May 1977). We associate logical interpretations with these*
> *LFs using a technique of internalising the logical binding mechanism*
> *(Muskens*
> *1996). The net result is that we obtain a Description Theory−like grammar*
> *in*
> *which the descriptions underspecify semantics. Since everything is framed*
> *in*
> *classical logic it is easily possible to reason with these descriptions.*
>
> *Internalising Binding*
> *How can we assign a semantics to the lexical descriptions in fig. 1? We*
> *must*
> *e.g. be able to express the semantics of n1 in terms of the semantics of*
> *n2,*
> *whatever the latter turns out to be, i.e. we must be able to express the*
> *result of quantification into an arbitrary context. In mathematical*
> *English*
> *we can say that, for any @, the value of allx@ is the set of assignments a*
> *such that for all b differing from a at most in x, b is an element of the*
> *value of @. We need to be able to say something similar in our logical*
> *language. The language must talk about meaning; it must talk about things*
> *that function like variables and constants, things that function like*
> *assignments, etc. The first will be called registers, the second states.*
> *Two*
> *primitive types are added to the logic: Pi and s, for registers and states*
> *respectively. We shall have variable registers, which stand proxy for*
> *variables and constant registers for constants. ...*
>
> *We have essentially mimicked the Tarski truth conditions for predicate*
> *logic*
> *in our object language and in fact it can be proved that, under certain*
> *conditions, we can reason with terms generated in this way as if they were*
> ***the predicate logical formulas they stand proxy for (see Muskens 1998).*
>
> *It should be stressed that the technique discussed here can be used to*
> *embed any logic with a decent interpretation into classical logic. For*
> *example, (Muskens 1996) shows that we can use the same mechanism to embed*
> *Discourse Representation Theory (DRT, Kamp & Reyle 1993). In a full*
> *version of this paper we shall also present a version of our theory based*
> *on DRT."*
>
> *SH: This indicates to me that if predicate logic can be embedded, then*

> so can a simpler aspect, truth functional proxies, akin to propositional
> logic which would help logical reasoning about natural language input.
>
> I found researching this thread from vague memories quite interesting.
>

> "In Sentential Logic, we can prove an argument schema to be invalid by
> specifying a set of truth assignments to the sentential letters which
> results in true premises and a false conclusion; we thereby show that one
> line of the argument schema's truth table allows an interpretation having
> true premises and a false conclusion. In Predicate Logic, an argument
> >schema typically consists of sentence schemata which are not truth
> functional: quantifiers, not truth functional connectives, are the major
> operators of the typical "quantified
>
> *argument schemata." And quantifiers are not truth functional operators
> since they may represent an infinite number of individuals; the truth
> value of a quantified sentence schema is therefore not a function of the
> truth values of any _finite_ number of simple sentence schemata.
>
> *Nevertheless, we can test the validity of a quantified argument schema
> _indirectly_ by constructing and testing its _truth functional proxy for
> some_ (non−empty) _domain_ of a specified (finite) number of individuals;
> each of the premises, and the conclusion, in the original schema will be
> equivalent _in that domain_ to its truth functional counterpart in the
> proxy.
>
> Because it is comprised of truth functional sentence schemata, a proxy may
> be tested for validity by the short−cut method of truth value assignment,
> or by *means of a truth table.*
>
> And if a proxy proves to be invalid, it will provide a "recipe" for
> constructing an interpretation of the corresponding quantified argument
> schema into the same domain which will serve as a counter example, or
> refutation, to that argument schema. Thus, if the original quantified
> argument schema is valid, then _all_ of its corresponding proxies must
> also be valid. If _any one_ of the proxies corresponding to a quantified
> argument schema is invalid, then since it is therefore possible for the
> schema to have an interpretation into some domain under which its premises
> are true while its conclusion is false, the schema itself is invalid. Note
> that even though one particular corresponding proxy is valid, the original
> quantified argument schema might nevertheless be invalid: to be valid,
> _every_ corresponding proxy (for _every_ non−empty domain) must be valid."
> http://www.lawrence.edu/fast/boardmaw/analytic_essay.html

> Regards,
> Stephen
>
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