Abstract Transport XOR Trick

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In this paper I show that one can use XOR to simplify proofs where there is some abstraction transport.

In Path Semantical Logic[1], there are 4 binary relations that transports abstractly[2]:

eq, rimply, imply, $true_2$

The `$true_2$` relation is the same as not specifying any relation.

When some abstract relation is specified, the relation is one of the following 3 functions:

eq, rimply, imply

As a proposition:

some_abstract_relation(a, b) = a=b ⊻ b=>a ⊻ a=>b

One can use the following tautology:

∀ a, b { (a=b ⊻ b=>a ⊻ a=>b) = (a ⊻ b) }

Simplified:

some_abstract_relation(a, b) = a ⊻ b

For example, one can prove the following:

(a, b) (A, B):
a ⊻ b, a(A)=b(B) => (A¬=B)=>(A=>B ⊻ B=>A)

References:

[1] "Path Semantical Logic"
AdvancedResearch, reading sequence on Path Semantical Logic
https://github.com/advancedresearch/path_semantics/blob/master/sequences.md#path-semantical-logic

[2] "Concrete and Abstract Transport"
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https://github.com/advancedresearch/path_semantics/blob/master/papers-wip/concrete-and-abstract-transport.pdf