

Interior vs Exterior

by Sven Nilsen, 2020

In this paper I define Interior vs Exterior for Avatar Extensions.

In the paper “Witness Duality”^[1], I introduced the Product Witness and the Loop Witness.

The Loop Witness has its origin in equivalence as an identity morphism^[2]:



This consists of:

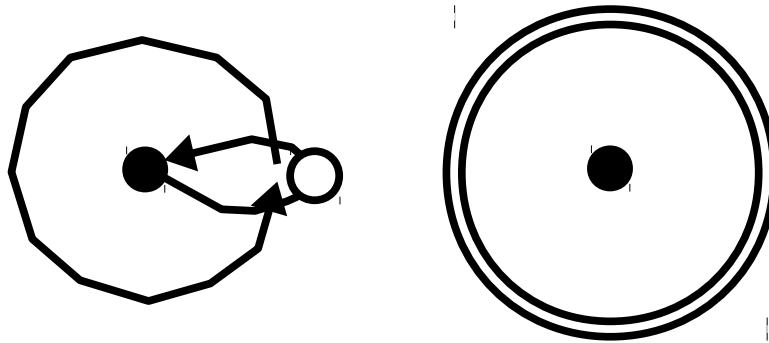
- A “core” or “core self”, represented as a black node (as in Avatar Graphs^[3])
- An identity morphism from the core to itself

Think about this as a system in a ground state.

This ground state, related to a Product Witness, is the *Interior*.

The Product Witness gives the core topological^[4] properties, due to Symmetry Forcing^[5].

The *Exterior* might be thought of as a loop onto the identity morphism, with a 1-avatar extension:



Basically, the Exterior forms a kind of one-dimensional surface around the core.

The distance from the core the surface can be ignored, as it is not relevant for this definition.

The Exterior can be thought of as having no identity morphisms, but a loopy isomorphism to itself.

This is also known as an *automorphism*^[6]. Here, the automorphism is a particular kind, that no part of it has an identity morphism, because it has not been introduced yet as an Avatar Extension^[7]. The original identity morphism comes from the core, which is consumed as resource to construct the automorphism.

One can think about the Exterior as having a direction of rotation,

although the concrete direction might be ignored in many cases.

Just as the Interior is related to topology^[4], the Exterior is related to exterior algebra^[8].

References:

- [1] “Witness Duality”
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