

General Existential Path of Language

by Sven Nilsen, 2018

In this paper I represent a high level idea of language that I discussed with Adam Nemecek: How the existential path is defined in some language defines the language. Everything that can be said about something in some language is limited to what the existential path implies. From path semantics it follows that two languages with same definition of the existential path are equivalent. For every unique language there must be some existential path definition, but there is no way to describe all existential path definitions across all languages. However, one can say what this general existential path is not.

One can create a self-referential sentence that refers to some external general set of objects:

This sentence refers to everything that can only be negatively defined.

The objects that this sentence talks about are the kind which definition causes problems of defining them. So, while one can not speak of what these objects are directly, one can speak of them in terms of what they are not. They are “not like this” or “not like that”. This is a way to communicate the idea of these objects without needing a complete definition.

In this paper, I will use this technique to talk about the general idea of an existential path of a language.

$\exists f : B \rightarrow \text{bool}$

Existential path of a normal function tells which objects the function returns

$f : A \rightarrow B$

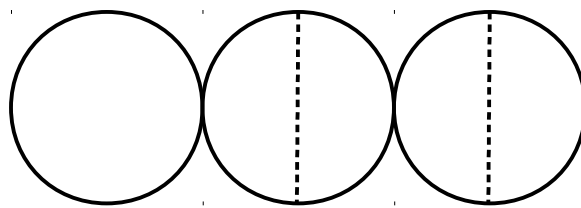
Existential paths are defined for every language, but its interpretation varies with the language.

$\exists R \Leftrightarrow (= AB)$

Existential path of a rule in an L-system tells which objects the rule returns that are different from the input, because “do nothing” means return input

$R := A \rightarrow AB$

Sometimes the interpretations can vary in ways that are really mind blowing:

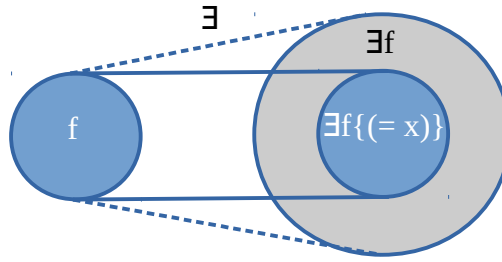


The existential path of contracted Havox-diagrams applying rules predicted by natural numbers constructs topological/homotopological properties of proof contradictions that are inter-contradictive

For example, the existential path of contracted Havox-diagrams predicted by natural numbers “is” the natural numbers, plus these diagrams have additional properties of transformations that when organized in systematic ways correspond to functions of natural numbers. The existential path is very complex.

For every language, there must be some mechanism of associating ideas. This is a path. By organizing paths into patterns, one can exploit symmetries in a such way that they can be compressed and expressed in a more concise form. This leads to an abstract object that in some way or another resembles a function. I will refer to these objects in general as the “general function”.

The general function is implied by the general existential path, because the input can be constrained in a such way that it equals the input structure. So, every definition of a general function follows indirectly from a higher order definition of the general existential path. Yet, you have to know the definition of some general function to derive the general existential path for it.



*The definition of a general function leads to its general existential path,
through a definition of existential path for the language,
which then contains a subset that mirrors the general function*

However, not only does the general existential path imply the general function, it also implies everything else that can be said about the general function.

For example, in path semantics for functions, every normal path is implied by the existential path:

$$\exists f\{[g_i] x_i\} \Rightarrow [g_n] f[g_{i \rightarrow n}](x_i)$$

This means that every predictable property of functions and everything that can be said about them is also implied by the existential path. Everything that can be said, or proven, about the function is said through the existential path.

Since everything that can be said about every object described by some language is precisely constrained to what the general existential path for that language implies, it means that the language is defined by its general existential path:

$$\exists \Leftrightarrow \text{“what this language means”}$$

However, if one tries to explain what `∃` means for all languages, one gets a contradiction: Contracted Havox diagrams shows that contradictions in proofs themselves form a language, which are predicted by structures that one might or might not think about as a language. So, if one wrote down a complete definition, then it would be possible to contradict the definition and create a new language based on how it contains inter-contradictions. This seems to imply that a such language should be included in the definition, but when it is included, the contradictions the language constructs from are false, yet it is another valid language because it still talks about something. Therefore, the general existential path of language can not be spoken of directly, because when we do, we make a choice that makes it impossible to speak of it in other ways, so the only way to speak of it is by saying what the general existential path is not: “It is not like this” or “it is not like that” etc. It can only be negatively defined.