Avatar Zen Ladders

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In this paper I introduce a list of sets which satisfy Zen language levels.

In the paper "Zen Languages"[1], I introduced a simple domain specific language that resembles the philosophy of Zen[2]. However, this definition does not allow a formal mathematical object. In order to support formal mathematical objects one needs something which satisfies Zen language levels.

An Avatar Zen Ladder is a list of sets of the following property:

$$\text{azl}(s : \text{set}, x : [\text{set}]) = \forall \; i \; \text{len}(x)\text{-}1 \; \{ \; x[i+1] \in x[i] \; \} \land (x[0] \in \text{pow}^{\wedge}\text{len}(x)(s))$$

x : [azl] true   `x` is an Avatar Zen Ladder

Here, `pow` is the power set operator[3].

The name `azl` is an abbreviation for `avatar_zen_ladder`.

Avatar Zen Ladders satisfy Zen language levels and makes them more intuitive. The length of the list is the Zen level and the list is a sequence of sets where each successor is a member of the predecessor.

The name "avatar" comes from Avatar Extensions[4], due to the wrapping of successive sets.
The name "ladder" comes from the story of Jacob's ladder[5].

The set `s` is used to generate a higher power set which functions as a "context".
Since the higher power set takes up a lot of space, one can use `s` instead, for reasoning about it.

References:

[1]   "Zen Languages"
        Sven Nilsen, 2021
        https://github.com/advancedresearch/path_semantics/blob/master/papers-wip2/zen-languages.pdf

[2]   "Zen"
        Wikipedia
        https://en.wikipedia.org/wiki/Zen

[3]   "Power set"
        Wikipedia
        https://en.wikipedia.org/wiki/Power_set

[4]   "Avatar Extensions"
        AdvancedResearch – Summary page on Avatar Extensions
        https://advancedresearch.github.io/avatar-extensions/summary.html

[5]   "Jacob's ladder"
        Wikipedia
        https://en.wikipedia.org/wiki/Jacob's_Ladder