GPV

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9:33 AM

From the GPV page of 2006-09:

Given V, we need an extention of V to singular semi-virtual knot diagrams, satisfying

E1. $\times\!\!\!\!\bullet = \times_+ - \times_-$

E2. $\underbrace{\times\!\!\!\!\bullet \ \times\!\!\!\!\bullet \ \ldots \ \times\!\!\!\!\bullet}_{>n} = 0$

<u>Failure #1</u> Extend V by 0. If a diagram has a $\times$ or a $\times\!\!\!\!\circ$, V is zero. (more precisely, if a diagram has a $\times\!\!\!\!\circ$ or is not planar.)

<u>Defect</u>: No reason it should satisfy E1.

<u>Failure #2</u> Extend V by 0 to $CA_0\langle \times, \times \rangle$ use E1 to extend it to $CA_0\langle \times, \times, \times\!\!\!\!\bullet \rangle$

<u>Defect</u>: No reason it should satisfy E2.

<u>Moral</u>: The extension must take account of the original, best by a "projection" $P: CA_0\langle \times, \times, \times\!\!\!\!\bullet \rangle \to CA_0\langle \times \rangle$ for which $(P\circ\iota)(D)$ is isotopic to D, for $D \in CA_0\langle \times \rangle$, where $\iota: CA_0\langle \times \rangle$ is the obvious inclusion.

<u>Failure #3</u> Define P by mapping any virtual xing to (say) an undercrossing, extend by means of E1.

<u>Promise</u> Will satisfy E2!

<u>Defect</u>: Makes no sense! There is no such thing "virtual xings"! And if you force a choice of a PVD representing the given VD, the result will depend on that choice.

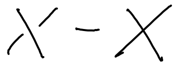
<u>Moral</u> We need an algorithm that given a virtual diagram

knot produces a canonical way of drawing it in the plane, so that when applied to a non-virtual, it acts as the identity.

<u>Failure #4</u> Given a Gauss Diagram, find a spanning tree in it and embed it in the plane then connect the leafs using descending strands. [then extend using E1]

<u>Cool fact</u> Hey, there's a particularly lovely way of choosing trees out there!

<u>Problem</u> It is hard to understand E2. If a xing goes virtual, the spanning tree goes bezerk and we cannot control the difference

.

<u>Question</u> Is this a real defect or just a failure in our ability to prove something?