

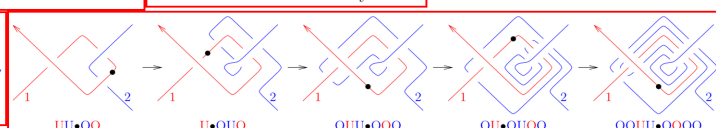
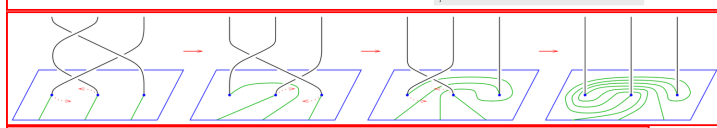
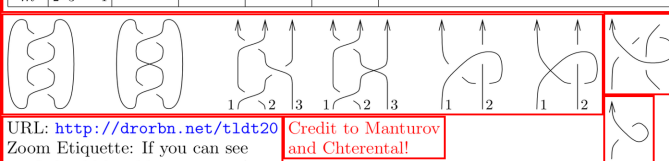
Formal definition of the n -strand classical braids with $(\leq m)$ -xing:

Formal definition of the n -strand virtual braids with $(\leq m)$ -xing:

Formal definition of the n -strand pure virtual braids with $(\leq m)$ -xing:

n -strand (pure) virtual braids with $(\leq m)$ -xing:

$m \backslash n$	2	3	4	5	6	General n
0	1	1	1	1	1	$2n^2 - 2n + 1$
1	5	13	25	41	61	$2n^4 + 4n^3 - 18n^2 + 12n + 1$
2	17	145	529	1361	2881	$\frac{1}{3} (4n^6 + 36n^5 - 2n^4 - 546n^3 + 1066n^2 - 558n + 3)$
3	53	1561	10873	43121	127021	
4	161	16717	222289	1351481	5484721	
5	485	178873	4540201			
6	1457	1913737				
m	$2 \cdot 3^m - 1$					



n -strand classical braids with $(\leq m)$ -xing:

$m \backslash n$	2	3	4	5	6	General n
0	1	1	1	1	1	$2n - 1$
1	3	5	7	9	11	$2n^2 + 2n - 7$
2	5	17	33	53	77	$\frac{1}{3} (4n^3 + 18n^2 - 22n - 63) \quad (n > 2)$
3	7	47	131	259	439	
4	9	115	469	1143	2233	
5	11	263	1579	4743	10603	
6	13	577	5121	18941	48209	
7	15	1233	16219	73817	213119	
8	17	2589	50581	283165	924825	
9	19	5371				
m	$2m + 1$	$12 \cdot 2^m - 2F_{m+5} - 2m - 1$				

Over then Under Tangles

Trends in Low-Dimensional Topology, online, May 5 2020, noon.

Abstract. Brilliant wrong ideas should not be buried and forgotten. Instead, they should be mined for the gold that lies underneath the layer of wrong. In this paper we explain how "over then under tangles" lead to an easy classification of braids and under the surface, also to some valid mathematics: an easy classification of braids and virtual braids, an understanding of the Drinfel'd double procedure in quantum algebra, and more.

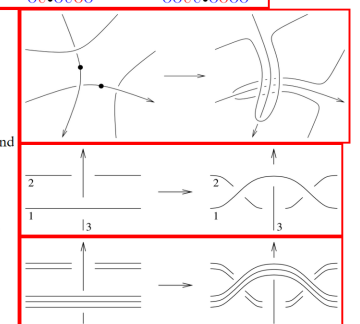
Based on a [paper in preparation](#) with Zsuzsanna Dancso and Roland van der Veer.

Handout: [EGOU.html](#), [EGOU.png](#).

DBN **Talk Video.**

Pensieve.

URL: <http://drorbn.net/tldt20>.



Not what I do, but the tangent I was on for the last few weeks. But first, the tangent to the tangent I was playing with over the last few *days*. Possibly an embarrassment!

Every braid (classical or virtual) has a directed finite graph associated with it. These are cool!

- Enriquez' universal quantization of Lie bi-algebra.
- All else about quantization of Lie bi-algebra.
- PBW / normal ordering.
- Audoux-Meilhan "Characterization of the Reduced-Perihel System of Links".
- B-N's "Balloons and Hoops" paper.

This is Demo.nb at <http://drorbn.net/ap/Talks/TrendsInLDT-2005/>.

BR[3, {1, 2, 1}] // ExtractionGraph

Knot[8, 1] // BR // Echo // ExtractionGraph

BR[5, {-1, -1, -2, 1, -2, -3, 2, 4, -3, 4}]

BR[3, {1, -2, 1}] // ExtractionGraph

BR[3, {1, -2, 1, -2}] // ExtractionGraph

VPB[5, {σ_{3,1}, σ_{2,4}, σ_{5,2}, σ_{1,2}, σ_{4,1}, σ_{2,3}, σ_{2,1}, σ_{5,3}] // ExtractionGraph

BR[4, {1, 2, 3, 1, 2, 1}] // ExtractionGraph

Knot[4, 1] // BR // Echo // ExtractionGraph

KnotTheory: The minimum braids representing the knots with up to 10 crossings were provided by Thomas Gittings. See [arXiv:math.GT/0401051](https://arxiv.org/abs/math/0401051).

BR[3, {-1, 2, -1, 2}]

Knot[6, 1] // BR // Echo // ExtractionGraph

BR[4, {-1, -1, -2, 1, 3, -2, 3}]

BR[3, {-1, -1, 2, -1, 2}]

BR[5, {1, 2, 3, 4, 1, 2, 3, 1, 2, 1}] // ExtractionGraph

Knot[6, 3] // BR // Echo // ExtractionGraph

BR[3, {-1, -1, 2, -1, 2}]

- Subsets.
- Supersets.
- Subsets of supersets.
- Completions.
- Quotients.
- Images.
- Completions of subsets of supersets...