Preview of the mathematics.

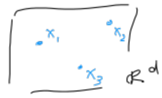
Thom classes: $W \subseteq M$. $\tau_W(\sigma : \Delta^n \to M) = \#\{\sigma^{-1}(W)\}$

Ex $\mathbb{R}^2 - 0$, $W =$ x-axis > 0

$\tau_W(\sigma) = 1$

Ex $\mathrm{Conf}_n(\mathbb{R}^d)$

Ex

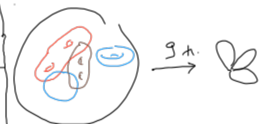


Hopf $f : S^3 \to S^2$

count $d^{-1} f^{-1}(p) \cap f^{-1}(q)$

$g : S^4 \to S^2 \vee S^2 \vee S^2$ (p, q, r)

$P = g^{-1}(p)$, Q, R.



Take $d^{-1}P \cap d^{-1}Q \cap R$

Hopf inv't of g.

---

geometry: linking

algebra: Harrison complex (Bar cx)

combinatorics: graphs & trees.

categories: Quillen functors

$\pi_1(S^1 \vee S^1 \vee S^1) \longleftrightarrow$ $a\ b\ a^{-1}$ ...

$[[a, b] c] =$ $a\ b\ A\ B\ c\ b\ a\ B\ A\ C$

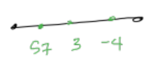
$\#\{\text{“}d^{-1}a \cap d^{-1}c \cap b\text{”}\} = 1$

Char classes — $H_* \,\&\, H^*$ infinite Grassmannians

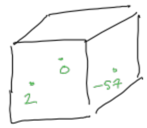
- revisit foundations through Thom classes.
- H_*, H^* pairing H_* rep'd by $(\prod P^i)$

E-M spaces. → "Natural" geom models $K(\mathbb{Z}, 1)$ S^1

→ Geom. of simplicial model



$K(\mathbb{Z}, 3)$



$BS_n \simeq \mathrm{Conf}_n(\mathbb{R}^\infty)/S_n$ — unordered config. spaces

H_* H^*

→ Hopf ring structure.

$\Rightarrow H^*(\varinjlim \Omega^n_0 S^n) \cong H^* BS_\infty$

Revisit EM spaces

- Blakers-Massey Theorem. (start w/ Koszul duality)

⟶ knot invariants! current work.

- Thom classes, cup products, cup-i .... ⇝ E_∞-models ??