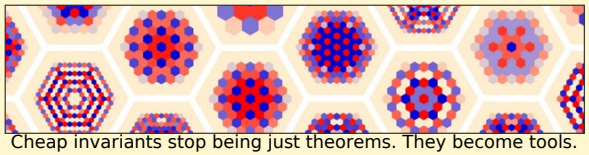
Applications of a fast and strong knot invariant

Or: once an invariant is cheap, use it everywhere. July 2026

Fast + strong= use it everywhere

Theta as infrastructure

0. Memory hook



Cheap invariants stop being just theorems. They become tools.

Moral cheap + strong = infrastructure

1. Theta: the sanity check

Bar-Natan--van der Veen: fast, strong, topologically meaningful, and fun.

Use 10k runs; avoid duplicates

2. What to remember

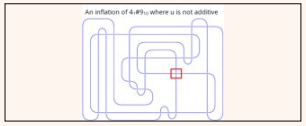
Unknot the right move may look wrong

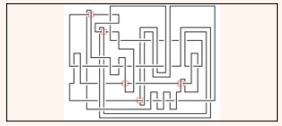
Phone ML guesses; topology checks

Game humans generate routes; Theta filters bugs

Slogan trust before reward

Unknotting: local intuition loses

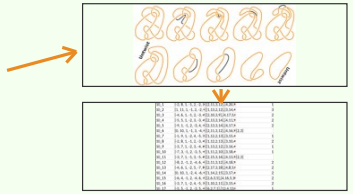




u(K) minimal crossing flops to unknot

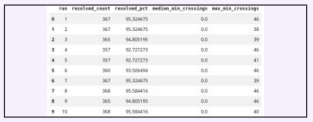
Problem the good crossing may be hidden

Self-improving search loop



Loop find -> inflate/flop -> reduce -> update

Result: not just a toy

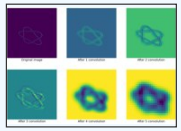


Data hard unknots are a stress test

Result nontrivial reductions about 95% of the time

u(K) improved unknotting-number bounds

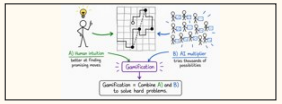
Pictures: ML guesses; invariants check



Dream photo -> diagram -> invariant -> knot

Theta fast reliable filter on a phone

Gamification: many humans, many routes



Humans intuition still beats AI

Game humans do not get bored

Bug physics can lie; double-check with Theta

Question hooks + credits

Ask me about Theta, why crossing flops need inflation, how to certify recognition, and what useful game data should look like.

People B-N--vdV; Brittenham--Hermiller; Applebaum et al.; ...

Slogan Fast + strong = use it everywhere

Thanks Theta cheap enough to be useful everywhere