RESEARCH STATEMENT

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1. Set Theory

Combinatorial set theory and Boolean algebras, mainly Souslin tree constructions with special emphasize on the structural properties of the associated Souslin algebras. I constructed some Souslin algebras with strong homogeneity properties, such as *chain homogeneity*, i.e., there is only one order type of Souslin line associated to the algebra.

I also studied some forcing techniques applicable to Souslin trees.

Favourite open problem: *Is it consistent relative to ZFC, that there is exactly one Souslin line (without separable intervals, up to isomorphism)?*
I call this problem "Souslin's hypothesis minus one", as there would be essentially only one counter example to Souslin's hypothesis.

2. Proof Complexity

I recently studied the basics of proof complexity and am currently trying to get a grip on Krajíček's forcing style approach to proving lower bounds on the length of proofs of families of propositional tautologies. This problem is tightly bound to the famous NP vs. co-NP problem of computational complexity.

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