

I have worked on several research projects. Here is a sample, in order of relevance:

- Computer-checked proofs of correctness of the algorithms used to implement a logic programming language called miniKanren.
- Developing a formal semantics (logical model of the operation) of miniKanren.
- Investigating how to add a tabling mechanism—for caching results and calculating fix-points—to miniKanren.
- A new implementation of the algorithm for unifying terms in nominal logic that uses a faster representation of substitutions.
- Redesign and new implementation of a data structure to organise parallel computations by prioritising fast-finishing ones.
- Using random sampling to approximate the probable values of hidden variables in Bayesian network models with structured variables.
- Developing software to simulate the Jacky lizard tail flick movement and to investigate the evolution of this animal signal.
- Comparing parts of the genetic sequence of mouse strains with different susceptibilities to breast cancer.
- Testing whether a drug interferes with a vital function, lactate transport, of the malaria parasite.