

My primary interest lies at the intersection of formal logic and learning. State of the art learning with neural networks models intelligence behaviorally, i.e. a particular input-output relationship. I hope to advance novel ideas that bridge the gap between symbolic, interpretable reasoning, and the gradient-based world of neural networks. I am also interested in program synthesis by example. It may be useful to study the problem of characterizing programs by the smallest set of input-output examples that determines them (when is a program the smallest program consistent with some examples?). Finding such (hopefully) small sets would be useful for the general program synthesis problem: for what classes of programs and what kinds of examples is program synthesis from examples well defined? Finally, I am interested in studying the synthesis problem for programs that implement cryptographic protocols. Smart contracts, which are small, may be amenable to synthesis techniques.