

Proofs-as-programs: from logic to AI

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Abstract. The proofs-as-programs correspondence is a foundational concept that connects logic and computation. The origins of this idea can be traced back to the relationship between logic and lambda calculus. Extensions to various logical and computational systems highlights its versatility and broad applicability across different domains of mathematics and computer science. It is at the heart of formal verification of mathematical proofs.

In this talk, we give an overview of this correspondence in different frameworks of computation and communication in distributed systems. The focus is on recent results which lead to safe orchestrations of federated (machine) learning algorithms.