

# Abstracting Quantum Computation

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## Abstract

Quantum computers have the potential to drastically outperform conventional computers for a variety of tasks, from simulating molecular interactions to machine learning. However, our understanding of how to construct non-trivial quantum algorithms is still in its infancy and human intuition is not well suited to finding ways to accomplish computational tasks through quantum interference. As a result, reaching a future where quantum computing is widely used requires not only overcoming the challenges of building scalable quantum computers, but also finding new ways to program these systems to tackle new and more complex problems.

In this talk I will introduce some of the work we have been doing at Horizon Quantum Computing to simplify the task of programming quantum processors through increasing levels of abstraction, and discuss progress towards our goal of compiling classical code to take advantage of quantum processors, through automated synthesis of quantum algorithms.