



## WINNING PROPOSAL

### Backpropagating Through Quantum Computers

DARPA Grant  
Awarded in Spring 2020

## GRANT WINNER

Nathan Killoran, Ph.D.  
Quantum Computing

Xanadu

“Polyplexus provides a nice mechanism for filtering thousands of pages of published literature down to individual focused insights, making it much easier to see how things might link together.”

## HOW

### Collaborating Across Areas of Expertise and Institutions

Participated in short-term Polyplexus workshop with representatives from nearly 20 organizations

Leveraged research in AI, machine learning and quantum computing and recent software developments to formulate quantum machine learning



## WHAT

### Disrupting the Status Quo

- Uses open source software (PennyLane) to explore the power of backpropagation methods for QML
- Compares to numerical methods
- Discovers computational enhancements for current QML backprop methods to make their performance better than the classical baseline

## WHY

### Powering Research Sponsors

Benefits DARPA research in:

- Artificial Intelligence
- Deep learning
- Quantum computing