



European IT Certification Curriculum Self-Learning Preparatory Materials

EITC/AI/TFQML
TensorFlow Quantum Machine Learning



This document constitutes European IT Certification curriculum self-learning preparatory material for the EITC/AI/TFQML TensorFlow Quantum Machine Learning programme.

This self-learning preparatory material covers requirements of the corresponding EITC certification programme examination. It is intended to facilitate certification programme's participant learning and preparation towards the EITC/AI/TFQML TensorFlow Quantum Machine Learning programme examination. The knowledge contained within the material is sufficient to pass the corresponding EITC certification examination in regard to relevant curriculum parts. The document specifies the knowledge and skills that participants of the EITC/AI/TFQML TensorFlow Quantum Machine Learning certification programme should have in order to attain the corresponding EITC certificate.

Disclaimer

This document has been automatically generated and published based on the most recent updates of the EITC/AI/TFQML TensorFlow Quantum Machine Learning certification programme curriculum as published on its relevant webpage, accessible at:

<https://eitca.org/certification/eitc-ai-tfqml-tensorflow-quantum-machine-learning/>

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TABLE OF CONTENTS

Introduction	4
Introduction to Google AI Quantum	4
Introduction to quantum computing	5
Implementing quantum computer	6
Building a quantum computer with superconducting qubits	6
Programming quantum computer	7
Programming a quantum computer with Cirq	7
Quantum supremacy	8
Quantum supremacy explained	8
Control of transmon qubits using a cryogenic CMOS integrated circuit	9
Quantum supremacy: benchmarking the Sycamore processor	10
Extracting coherence information from random circuits	11
Estimation of statistical significance of quantum supremacy	12
Overview of TensorFlow Quantum	13
TensorFlow Quantum: a software platform for hybrid quantum-classical ML	13
Layer-wise learning for quantum neural networks	14
Practical TensorFlow Quantum - binary classifier	15
Using Tensorflow Quantum for simple quantum binary classification	15
Practical Tensorflow Quantum - XOR problem	16
Solving the XOR problem with quantum machine learning with TFQ	16
Quantum XOR decision boundary with TFQ	17
Quantum reinforcement learning	18
Replicating reinforcement learning with quantum variational circuits with TFQ	18
Quantum Approximate Optimization Algorithm (QAOA)	19
Quantum Approximate Optimization Algorithm (QAOA) with Tensorflow Quantum	19
Variational Quantum Eigensolver (VQE)	20
Variational Quantum Eigensolver (VQE) in Tensorflow Quantum for single qubit Hamiltonians	20
Variational Quantum Eigensolver (VQE) in TensorFlow-Quantum for 2 qubit Hamiltonians	21
Optimizing VQE's with Rotosolve in Tensorflow Quantum	22

EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: INTRODUCTION****TOPIC: INTRODUCTION TO GOOGLE AI QUANTUM**

This part of the material is currently undergoing an update and will be republished shortly.

EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: INTRODUCTION****TOPIC: INTRODUCTION TO QUANTUM COMPUTING**

This part of the material is currently undergoing an update and will be republished shortly.

EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: IMPLEMENTING QUANTUM COMPUTER****TOPIC: BUILDING A QUANTUM COMPUTER WITH SUPERCONDUCTING QUBITS**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: PROGRAMMING QUANTUM COMPUTER****TOPIC: PROGRAMMING A QUANTUM COMPUTER WITH CIRQ**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM SUPREMACY****TOPIC: QUANTUM SUPREMACY EXPLAINED**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM SUPREMACY****TOPIC: CONTROL OF TRANSMON QUBITS USING A CRYOGENIC CMOS INTEGRATED CIRCUIT**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS

LESSON: QUANTUM SUPREMACY

TOPIC: QUANTUM SUPREMACY: BENCHMARKING THE SYCAMORE PROCESSOR

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM SUPREMACY****TOPIC: EXTRACTING COHERENCE INFORMATION FROM RANDOM CIRCUITS**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM SUPREMACY****TOPIC: ESTIMATION OF STATISTICAL SIGNIFICANCE OF QUANTUM SUPREMACY**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: OVERVIEW OF TENSORFLOW QUANTUM****TOPIC: TENSORFLOW QUANTUM: A SOFTWARE PLATFORM FOR HYBRID QUANTUM-CLASSICAL ML**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: OVERVIEW OF TENSORFLOW QUANTUM****TOPIC: LAYER-WISE LEARNING FOR QUANTUM NEURAL NETWORKS**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: PRACTICAL TENSORFLOW QUANTUM - BINARY CLASSIFIER****TOPIC: USING TENSORFLOW QUANTUM FOR SIMPLE QUANTUM BINARY CLASSIFICATION**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: PRACTICAL TENSORFLOW QUANTUM - XOR PROBLEM****TOPIC: SOLVING THE XOR PROBLEM WITH QUANTUM MACHINE LEARNING WITH TFQ**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: PRACTICAL TENSORFLOW QUANTUM - XOR PROBLEM****TOPIC: QUANTUM XOR DECISION BOUNDARY WITH TFQ**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM REINFORCEMENT LEARNING****TOPIC: REPLICATING REINFORCEMENT LEARNING WITH QUANTUM VARIATIONAL CIRCUITS WITH TFQ**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: QUANTUM APPROXIMATE OPTIMIZATION ALGORITHM (QAOA)****TOPIC: QUANTUM APPROXIMATE OPTIMIZATION ALGORITHM (QAOA) WITH TENSORFLOW QUANTUM**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: VARIATIONAL QUANTUM EIGENSOLVER (VQE)****TOPIC: VARIATIONAL QUANTUM EIGENSOLVER (VQE) IN TENSORFLOW QUANTUM FOR SINGLE QUBIT HAMILTONIANS**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: VARIATIONAL QUANTUM EIGENSOLVER (VQE)****TOPIC: VARIATIONAL QUANTUM EIGENSOLVER (VQE) IN TENSORFLOW-QUANTUM FOR 2 QUBIT HAMILTONIANS**

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EITC/AI/TFQML TENSORFLOW QUANTUM MACHINE LEARNING DIDACTIC MATERIALS**LESSON: VARIATIONAL QUANTUM EIGENSOLVER (VQE)****TOPIC: OPTIMIZING VQE'S WITH ROTOSOLVE IN TENSORFLOW QUANTUM**

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