Comenius University Bratislava
Faculty of Mathematics, Physics and Informatics

THESIS ASSIGNMENT

Name and Surname:	Michal Švec
Study programme:	Computer Science (Single degree study, bachelor I. deg., full time form)
Field of Study:	Computer Science
Type of Thesis:	Bachelor´s thesis
Language of Thesis:	English
Secondary language:	Slovak

Title: Optimization of Variational Quantum Eigensolvers

Annotation: Quantum computers have experienced an unprecedented boom in the recent years, thanks to IBM, which has made its quantum devices available using a cloud service. Quantum computers available today contain tens to a few hundred qubits, can execute a protocol with a depth of a few tens of steps, and are heavily influenced by errors and noise. Due to these properties they are often referenced as NISQ (Noisy intermediate-scale quantum) computers.
Within their work the student will gain basic understanding of fundamental aspect of quantum mechanics and working of quantum computers. We will focus on a specific hybrid quantum algorithm – Variational Quantum Eigensolver. It combines a simple quantum task – energy measurement of a given state - performed on a NISQ computer with optimization method running on a classical device. The student will optimize the quantum part of the algorithm by adjusting the preparation of the state for more efficient use of quantum resources.

Supervisor:	doc. RNDr. Martin Plesch, PhD.
Department:	FMFI.KI - Department of Computer Science
Head of department:	prof. RNDr. Martin Škoviera, PhD.
Assigned:	06.11.2023
Approved:	06.11.2023

doc. RNDr. Dana Pardubská, CSc.
Guarantor of Study Programme

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Student

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Supervisor