

PhD research topic proposal
BME, Doctoral School of Mathematics and Computer Science

Name and degree of supervisor :

András Pál Gilyén, PhD

Are you willing to supervise Stipendium Hungaricum applicants?

No

Title of the topic:

Quantum Computing

Short description:

Quantum computing can be considered the ultimate theory of computer science, as our physical world appears to allow building computers that are operating according to the rules of quantum mechanics. As small-scale devices have already been successfully constructed, and larger quantum computers are on the way, it is becoming increasingly important to understand how can we utilize such computers to solve various problems more efficiently. There are several important questions that need further investigation in this direction: (a) finding new problems in optimization, statistics, physics, or machine learning where quantum computers yield a significant advantage, (b) understanding the limitations of quantum computers for various problems and compare their computational power to the best classical algorithms, (c) exploring the novel possibilities in quantum communication (d) studying the efficiency of quantum error correction.

Requirements:

Masters in Mathematics, Computer Science, Physics or related disciplines. Solid background in linear algebra and the theory of computation; sufficient English skills to read and understand the related scientific literature.

Contact:

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Place of work:

Alfréd Rényi Institute of Mathematics