Motivational letter for 6th EAFExp Sep 29, 2022

Dear Sir or Madam,

I was thrilled when I heard about the possibility to participate in EAFExp at CBPF!

During my 5th semester, I worked with a team from one of Russia's major oil companies - 'GazpromNeft', gaining my first research experience and developing intuition in the field of quantum computing. As our task had application to the real case problem, I had a chance to work in a team, writing a system for solving the problem with quantum algorithm simulation. This experience significantly improved my communication skills, as I often had to interact with the code of my teammates. Later on I took the initiative to gain more experience by working additionally with the 'GazpromNeft' team, where we studied using the book "Quantum Computation and Quantum Information".

This spring I worked on a project under the supervision of Sergey Borisovich, during which I had to write improved quantum search algorithms and closely inspect one particular article. As a part of this project, I had successfully disproved my supervisor's hypothesis about the possibility of accelerating quantum computations with the 'reset' gate. It taught me the importance of researching existing ideas and gave me a deeper feeling of how the concept of matrix invertibility and the impossibility of spying on the quantum-entangled state of the system are related.

Currently, I have one last year left before receiving a bachelor's degree from St. Petersburg State University at July 2022. I am also already enrolled in Master's degree in mathematics at Pontifical Catholic University of Rio de Janeiro. Although my courses are mathematical, I am working a lot at the Photonics lab under the supervision of Thiago Guerreiro. I started working this September and my current task is to build Sagnac interferometer.

I am also currently working at a Rio Quantum network project at CBPF and want to be as helpful as possible. But as of my lack of experience in the practical aspect of physics I need to work a lot at the lab and find other ways to become more advanced in the field. I am very interested in applied physics and my goal is to work with experiments that allow processing of information that can be stored in the quantum states. That is why my first choice of the modules is "Quantum Computing and Quantum Information via NMR". Of course I would be more than happy to be accepted at any other module as I am only starting to find my way in experimental physics.

I am confident that my research experience, my educational background and interests will help me achieve my goals. This internship is the perfect opportunity for me to expand my horizons. I really hope to be of help and look forward to hearing from you.

Yours faithfully,

Ivan Ogloblin

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