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PostDoc Position in Quantum Networks

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Company: TU Delft

Location: Delft

Category: computer-and-mathematical

Job description

The vision of a Quantum Internet is to provide fundamentally new internet technology by enabling quantum communication between any two points on earth. Such a Quantum Internet will – in synergy with the 'classical' Internet that we have today - connect quantum processors in order to achieve unparalleled capabilities that are provably impossible using only classical communication.
At QuTech and the Quantum Internet Alliance, we are working on making such a network a reality.
Postdoc positions are available in the following domains:

1. **Quantum Network Architectures.** The goal of this position is to design and analyze large-scale quantum network architectures using both analytical methods and/or numerical simulation – including new entirely concepts, abstractions, mathematical methods, algorithms, as well as laying the foundations for the performance analysis of quantum networks. The successful candidate enjoys working at the boundary of computer science, physics and mathematics, and is excited by the idea their work may in the long run contribute to building large-scale quantum networks in the real world.
2. **Quantum Network Systems.** The goal of this position is the design and implementation of Quantum Network Systems concepts on state-of-the-art quantum

hardware on a small network of quantum processors, as well as supporting simulators. The successful candidate enjoys experimenting with different approaches, and is excited by computer and network systems research that works towards bringing quantum network technologies into the real world together with a diverse team from quantum hardware, software engineering, and quantum information.

3. **Quantum Network Applications**. The goal of this position is to discover new applications for a quantum network, including the design and analysis of quantum application protocols (numerically and/or analytically). The successful candidate enjoys exploring new ideas and application domains together with people from different domains and disciplines.

The candidate has the opportunity to advance their leadership abilities by proposing and supervising master student projects on the topic, as well as helping in the supervision of PhD students.

The successful candidates will work with Prof. Stephanie Wehner at QuTech, Delft University of Technology in the section on Quantum Computer Science and QuTech's Quantum Internet Division.

Requirements

You have a PhD degree in physics, computer science, computer engineering, mathematics or physics or comparable discipline at the time of taking on the position.

For the position on quantum network architectures and applications, prior expertise in quantum information is a must.

For the position on quantum network systems, experience in classical network systems, operating systems, or related domains is a must. A background in computer science or computer engineering is preferred.

You enjoy working in a team and bring excellent organizational, communication and interpersonal skills.

Conditions of employment

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities. The TU Delft offers a customisable compensation package, a discount on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged.

For international applicants we offer the to assist you with your relocation. An International Children's Centre offers childcare and there is an international primary school.

TU Delft

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context.

At TU Delft we embrace diversity and aim to be as inclusive as possible (see our Code of Conduct). Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale. Challenge. Change. Impact!

QuTech internet Division

The vision of a Quantum Internet is to provide fundamentally new internet technology by enabling quantum communication between any two points on earth. Such a Quantum Internet will – in synergy with the 'classical' Internet that we have today - connect quantum processors in order to achieve unparalleled capabilities that are provably impossible using only classical communication.

At QuTech and the Quantum Internet Alliance, we are working on making such a network a reality. As part of this effort, we are working on an architecture to control and program networks of distant quantum processors. This is made challenging both by fundamental differences between classical and quantum information, as well as technological limitations of near-term quantum devices. Right now, we have only a basic first system that allows us to execute quantum programs on a network of quantum processors. This includes an elementary quantum network operating system and compiler that can execute quantum programs on a real-world quantum network based on Nitrogen-Vacancy Centers in Diamond, as well as a custom built simulation platform that can be used to explore application requirements on a variety of hardware platforms.

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