Issues Realization of Quantum Computing Models through Functional Programming

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We will discuss issues that are one of the most promising research directions of modern information-communication technologies. This is the quantum computing model. In quantum calculations instead of the concept of bits that were introduced by Alan Turing and John von Neuman, the concept of cube or quantum bits is introduced.

Quantum bits are the quantum system that is before the measurement in any linear superposition of two base quantum conditions (ie, possibly able to take infinitely many possible meanings), and measurement results in one of the possible implications of these two.

In recent times, the model of quantum calculations has been greatly appreciated by both the scientists and the engineers, because it provides a wide range of possibilities for solving those tasks which have no effective algorithms for solving. For example, this task is the task of the factorization of the given number (Finding Simple Separators). That hypothesis that it is impossible to quickly and efficiently find the disintegration of a number as a mere multiplier, is based on modern methods of cryptography.

Functional programming, as a software paradigm, is very harmoniously modeled with a quantum calculation model, since the concept of "function" contains the concept of "unitary transformation" used in the quantum calculation model. So quantum algorithms are most naturally seen in functional programming frameworks. The high-level programming language *Quipper*, used to express the quantum computing schemes, is based on the language *Haskell,* but this language is not created. It is considered that functional programming is most closely related to quantum computation paradigm.

In this report we will describe the quantum calculation model, explain the concept of cubic, how can we combine the cubes to get a multi-point state, what is the quantum computing scheme. In the second part of the work we will develop Fremvorck, which will perform the quantum calculations in Language Haskell. This gives you a more flexible model of quantum calculations, creating new objects and operations of the quantum computing model.

References

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