

Abstract Submitted
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Some Thoughts Regarding Practical Quantum Computing DEB-
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sity of Missouri - Columbia — Quantum computing has become an important area
of research in computer science because of its potential to provide more efficient al-
gorithmic solutions to certain problems than are possible with classical computing.
The ability of performing parallel operations over an exponentially large computa-
tional space has proved to be the main advantage of the quantum computing model.
In this regard, we are particularly interested in the potential applications of quantum
computers to enhance real software systems of interest to the defense, industrial, sci-
entific and financial communities. However, while much has been written in popular
and scientific literature about the benefits of the quantum computational model,
several of the problems associated to the practical implementation of real-life com-
plex software systems in quantum computers are often ignored. In this presentation
we will argue that practical quantum computation is not as straightforward as com-
monly advertised, even if the technological problems associated to the manufacturing
and engineering of large-scale quantum registers were solved overnight. We will dis-
cuss some of the frequently overlooked difficulties that plague quantum computing in
the areas of memories, I/O, addressing schemes, compilers, oracles, approximate in-
formation copying, logical debugging, error correction and fault-tolerant computing
protocols.

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