

# ECECS 753 Project Abstract - Quantum Search

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One of the greatest demonstrations of the power of Quantum Computers over their classical counterparts is Lou Grover's Quantum Search algorithm. Where on a classical computer you'd need  $O(N)$ , where  $N$  is the number of items in an unsorted database, operations to ensure finding the desired item. Using Grover's algorithm it only takes  $O(\sqrt{N})$  operations, a quadratic speed-up from the classical algorithm.

I will be doing an in depth study into how Grover's algorithm works, its origins, strengths, weaknesses, applications, etc. This includes showing that it is indeed faster than any previously known search algorithm. By the end of the paper, the reader should be proficient with Grover's algorithm and the Quantum Computing topics necessary to understand and use it.