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Quantum Computation and Natural Language Processing

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Quantum computers hold great future promise for performing more energy efficient and especially faster calculations for various complex problems by making use of algorithms with quantum speed-up. The most famous of these is the so-called Grover search algorithm. One, maybe less known, research area where quantum computers may possible become of great importance is Artificial Intelligence (AI) and in particular Natural Language Processing (NLP). In this talk we will try to explain why this is the case and will also present some first proof-of-principle calculations on the superconducting quantum computer publicly available through the IBM Quantum Experience, with the ultimate aim of applying Grover's algorithm to the NLP task of question answering. We also explicitly show the limitations of the present-day noisy quantum computers due to decoherence processes.

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