



Speaker:

Dominic Widdows

Talk Title:

Which Language Operations to Implement First with Quantum Computers?

Talk Abstract:

Vector representations have been used in natural language processing for half a century, and have flourished particularly strongly in the past decade. The list of linguistic phenomena and operations modelled using vectors by now includes similarity and synonymy, negation and disjunction, conditionals and inference, hyponymy and classification, semantic composition, analogy, ambiguity resolution, sentiment analysis, and of course orthography and spelling correction.

The corresponding mathematical toolbox includes superposition, subspaces, projections, tensor products, density matrices, self-adjoint and positive operators, and spectral decompositions, all of which are also involved in quantum physics.

This talk will attempt to give a guided tour of this language zoo, in the hope that audience members with particular expertise in quantum physics and computing will be able to comment on which parts of this bestiary might be most promising candidates for early implementation on quantum hardware.

Examples will drawn especially from short informal language, including fragments from smartphone communications such as text messages and mobile search queries, where the need for effective language processing is especially pressing in some languages in emerging markets.