Quantum Computation at Microsoft

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Quantum mechanics is a fantastic resource for computing, both at software and hardware levels. The classical control of a large quantum system reminds us of the classical – quantum crossover. Avoiding decoherence requires near-perfect border control and error correction. The better the individual qubit building block, the less difficult it becomes to create large scale computing systems. At Microsoft we investigate the entire stack of a quantum computing system. My focus is on realizing stable building blocks with intrinsic insensitivity to noise. We use 'topology' as a mechanism to protect quantum information against decoherence. In particular, we pursue Majorana zero-modes as topologically protected qubits.