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Scheduling Quantum Programs ROBERT SMITH, MICHAEL CURTIS, ANTHONY POLLORENO, NICHOLAS RUBIN, NIKOLAS TEZAK, WILL ZENG, Rigetti Quantum Computing — In compiling quantum circuits it can be analytically convenient to assume each gate takes the same amount of physical time and to set our unit time step to the maximum gate time. However, as is the case on quantum computers based on superconducting qubits, each gate takes a certain distinct amount of time, which leads to the possibility of additional optimization. In this talk, we formalize the notion of gate times using quantum abstract machines as a foundation, and introduce methods to optimize gate scheduling via temporally dense parallelization using black-box information (i.e., no knowledge of the structure of the gate pulses) and white-box information (i.e., knowledge of the geometry of the gate pulses over time).

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