■初出勤

初出勤．Q 社に届いてた ADS9-V2EBZ で遊んでみる，など．

■論文メモ

サーベイが必要になったので，昔のメモを引っぱり出しつつ，再読み込み．

- https://aip.scitation.org/doi/10.1063/1.1884746 Frequency-domain multiplexed readout of transition-edge sensor arrays with a superconducting quantum interference device
  - Cabinet/Quantum/1.1884746.pdf
- https://dl.acm.org/doi/10.1145/1150019.1136518 Quantum Memory Hierarchies: Efficient Designs to Match Available Parallelism in Quantum Computing
  - QASM
- https://www.cs.princeton.edu/research/techreps/TR-934-12 Scaffold: Quantum Programming Language
  - https://github.com/epiqc/ScaffCC;
- https://arxiv.org/abs/1209.1781 Multiplexed dispersive readout of superconducting phase qubits
- https://arxiv.org/abs/1307.1740 Minimum weight perfect matching of fault-tolerant topological quantum error correction in average
  - software implementation
- https://www.nature.com/articles/nature12513 Deterministic entanglement of superconducting qubits by parity measurement and feedback
  - Cabinet/Quantum/nature12513.pdf
- https://arxiv.org/abs/1312.5064 Frequency Multiplexing for Readout of Spin Qubits
- https://www.nature.com/articles/nature23459 Programming languages and compiler design for realistic quantum hardware
  - Cabinet/Quantum/nature23459.pdf
  - INSIGHT:REVIEW
- https://arxiv.org/abs/1704.08314 Hardware for Dynamic Quantum Computing
  - APS2 and QDPS platforms are a complete hardware solution for dynamic quantum computing systems.
- https://arxiv.org/abs/1709.01030 Low-Latency Digital Signal Processing for Feedback and Feedforward in Quantum Computing and Communication
  - FPGA で量子コンピュータ制御の草分け的論文
- https://arxiv.org/abs/1709.06218 Almost-linear time decoding algorithm for topological codes
- https://dl.acm.org/doi/10.1145/3123939.3123952 An experimental microarchitecture for a superconducting quantum processor (MICRO'50)
  - QuMA
- https://arxiv.org/abs/1806.03660 High Performance and Scalable AWG for Superconducting Quantum Computing
- https://arxiv.org/abs/1806.03767 Scalable Self-Adaptive Synchronous Triggering System in Superconducting Quantum Computing
- https://arxiv.org/abs/1808.02449 eQASM: An Executable Quantum Instruction Set Architecture
  - QuMA の人達の ISA
  - with efficient timing specification, single-operation-multiple-qubit exec, VLIW
  - 他の QASM はマイクロアーキというには抽象度高い，か，量子ハードウェアを包括的に表現するには制限が多い，らしい
- https://arxiv.org/abs/1809.03452 Qiskit Backend Specifications for OpenQASM and OpenPulse Experiments
- https://arxiv.org/abs/1903.09575 Quantum Computer Architecture: Towards Full-Stack Quantum Accelerators
- https://arxiv.org/abs/1904.06560 A Quantum Engineer's Guide to Superconducting Qubits
  - 67 ページある
- https://arxiv.org/abs/1911.10841 High-rate, high-fidelity entanglement of qubits across an elementary quantum network
- https://arxiv.org/abs/1912.06814 State preparation of a fluxonium qubit with feedback from a custom FPGA-based platform
- https://arxiv.org/abs/2001.06598 A Scalable Decoder Micro-architecture for Fault-Tolerant

Quantum Computing
    - FPGA implementation
- https://arxiv.org/abs/2003.13961 An Open-Source, Industrial-Strength Optimizing Compiler for Quantum Programs
    - QUILC; Quil か QASM で書かれたゲートベース量子プログラムに対する最適化コンパイラ
    - https://github.com/quil-lang/quilc
- https://arxiv.org/abs/2004.04794 NISQ+: Boosting quantum computing power by approximating quantum error correction
- https://arxiv.org/abs/2004.11205 Optimized Quantum Compilation for Near-Term Algorithms with OpenPulse
    - 日々のキャリブレーションによるハードウェアに合わせた最適化をする
    - 下側は OpenPulse
- https://arxiv.org/abs/2008.09503 Systematic Crosstalk Mitigation for Superconducting Qubits via Frequency-Aware Compilation
    - crosstalk mitigation のために crosstalk graph を作って周波数割当てと命令スケジューリングを決める
- https://arxiv.org/abs/2009.01845 Qibo: a framework for quantum simulation with hardware acceleration
- https://arxiv.org/abs/2101.00071 QubiC: An open source FPGA-based control and measurement system for superconducting quantum information processors
    - https://gitlab.com/LBL-QubiC
    - VC707, FCM120(4ch 1.25Gsps 16bit DAC, 4ch 1Gsps 16bit ADC)
    - JSED204B SYSREF, GPIO trigger, white rabbitっぽい同期，でノード間の同期
- https://arxiv.org/abs/2102.13293 Entanglement Across Separate Silicon Dies in a Modular Superconducting Qubit Device
- https://arxiv.org/abs/2103.14209 QECOOL: On-Line Quantum Error Correction with a Superconducting Decoder for Surface Code
    - for 3-D lattice, with single flux quantum(SFQ)
    - code distances 5 to 13, 1.0% accuracy threshold
    - SPICE simulation, 2.78uW
    - MWPM(SW) vs UF(FPGA) vs AQEC(SFQ) vs QECOOL(SFQ)
- https://arxiv.org/abs/2103.07617 A low-noise on-chip coherent microwave source
- https://arxiv.org/abs/2106.06549 Programming the full stack of an open-access quantum computer
- https://arxiv.org/abs/2106.10488 Superconducting quantum computer: a hint for building architectures
- https://arxiv.org/abs/2108.06831 Tensor Networks for Simulating Quantum Circuits on FPGAs
- https://arxiv.org/abs/2109.05577 Observation of a symmetry-protected topological time crystal with superconducting qubits
- https://arxiv.org/abs/2110.00557 The QICK (Quantum Instrumentation Control Kit): Readout and control for qubits and detectors
    - ZCU111+Original-RF
    - tProcessor で高精度かつプログラマブルに SG を制御
- https://arxiv.org/abs/2110.07965 FPGA-based electronic system for the control and readout of superconducting qubit systems
    - 測定内容，数値など参考になる．QuBE もこういう風に測定したい
    - 超伝導量子ビット関係で必要になるパラメタなど参考文献にありそう．あとで読む
- https://dl.acm.org/doi/10.1145/3466752.3480116 Exploiting Different Levels of Parallelism in the Quantum Control Microarchitecture for Superconducting Qubits
    - Quantum Superscalar - exploits Quantum Operation Level Parallelism
    - cycles each steps(CES) = quantum instruction execution scycles + classical instruction cycles + controll stalles + feedback control
- https://arxiv.org/abs/2111.03696 Observation of two-mode squeezing in a traveling wave parametric amplifier
- https://arxiv.org/abs/2112.02933 ICARUS-Q: A scalable RFSoC-based control system for superconducting quantum computers
    - HTG-ZRF16(XCZU29DR 搭載) を使った超伝導 Qubit 制御・測定装置
    - ノイズ特性，安定性などの測定結果が参考になる

- https://phys.org/news/2021-11-radio-frequency-quantum.html How a novel radio frequency control system enhances quantum computers
- https://m-labs.hk/experiment-control/publications/ ARTIQ 関連