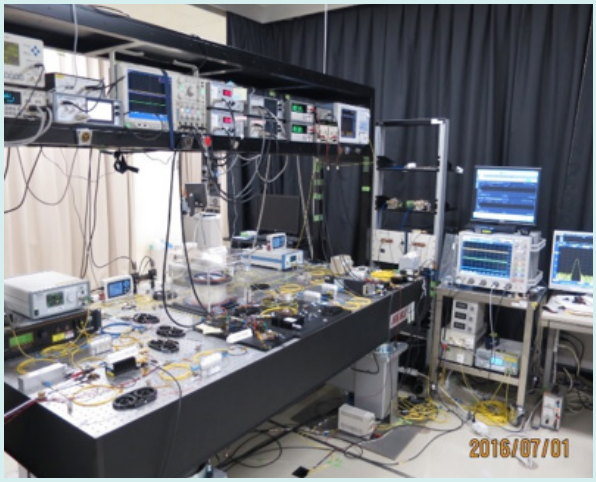
QSIT COLLOQUIUM

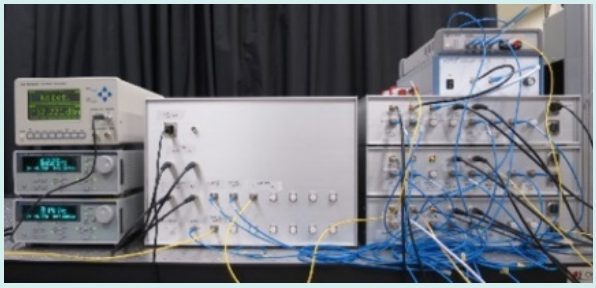
Quantum Science and Technology
National Centre of Competence in Research

Monday, 18 September 2017, 14:00 – 15:00 h
ETH Zurich, Hönggerberg, HPV G 5

Yoshihisa Yamamoto
Japan Science and Technology Agency, Tokyo, Japan

Quantum Neural Network for Cloud Service





We will introduce a novel computing machine based on optical neural network operating at the quantum limit. The machine employs 2'000 degenerate optical parametric oscillator pulses as quantum neurons and a single homodyne measurement-feedback circuit to implement all-to-all (4×10^6) quantum synaptic connections. The basic concept and quantum principle, quantum computing at criticality, of the new approach will be discussed, as well as the difference from gate-type and annealing-type quantum computers. The performance of this machine is evaluated against a quantum annealer by D-WAVE and various heuristics on CPU and supercomputers. The machine will be available online as a cloud server from November, 2017.

Host: Atac Imamoglu
www.nccr-qsit.ethz.ch

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