Exploring the World of Quantum Computing

Denis Gerrer,
Head of Quantum Computing Business Development

Mindshare 2023
September 19th/20th

EVIDEN
an atos business

Agenda

1 Introduction and Challenges

2 Eviden Solution

3 Uses cases

EVIDEN
an atos business

Introduction and Challenges

Main challenges

▶ **What is the right solution**

- Superconducting electronic spins

- Trapped ions

- Neutral atoms

- Photonic QPUs

- Carbon nanotubes

- Cat QPUs

▶ **Still in progress**

- Number of Qbits

- Error correction

- Integration with existing

EVIDEN
an atos business

So Why Quantum Computing now ?

Still a rocket science ?

▶ QC are real

▶ Emulator

▶ Programming environment

▶ Large investment in hardware and software

▶ Research centers

▶ Large companies

EVIDEN
an atos business

Eviden Solution

Qaptiva TM solutions portfolio overview

Qaptiva™ - Everything on Quantum Computing

Quantum Computing Services

Consulting

Training and Support

QC as a Service

Quantum Computing Products

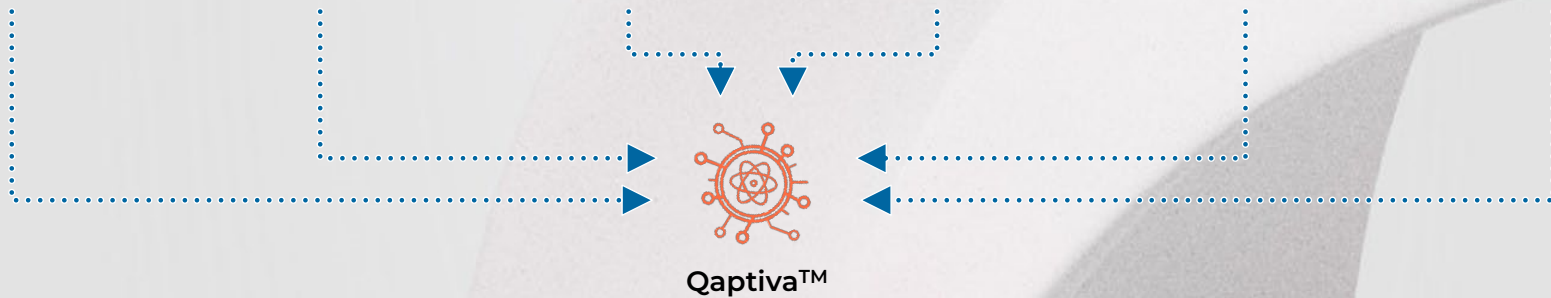**Hardware**
- Qaptiva™ 800
- Qaptiva™ POD
- Qaptiva™ Access

Software Licenses
- Emulation on HPC
- HPC Hybridization
- Qaptiva™ Q-Pragma
- 3rd party libraries

Freeware
- myQLM

Qaptiva™

EVIDEN
an atos business

Qaptiva™
Our vision on the market and critical differentiations

Investment Protection	Broad Ecosystem	Hybrid HPC/Quantum
Agnostic Freeware Programing environment Optimization Platform	Large ecosystem : Hardware Software Service R&D Adviser	HPC is our ARN Global leader HPC hybridization GPU, FPGA... Quantum Target FTQC and HPC.

EVIDEN
an atos business

Qaptiva™ Partner Ecosystem
Expanding offerings and capabilities to deliver more value

Software

Aerospace   Finance

Automotive   Healthcare
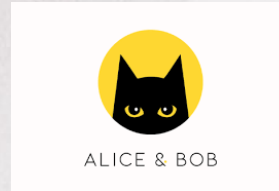
Defense   Logistics

Hardware

IQM
Superconducting

QUANDELA
Photonics

ALICE & BOB
CAT Qbits

PASQAL
Neutral atoms

EVIDEN
an atos business

Uses Cases

Shor Algorithm

Cryptography

▶ Definition
- – Prime factors of an integer
- – Quantum Algorithm

▶ Use case
- – Cryptography
  - • Break RSA key

▶ Limitation
- – Nb Qbit or Nb Gates
- – Fidelity (Noisy Qbit)

EVIDEN
an atos business

Annealing or Simulated Quantum Annealing (SQA)

Anomaly detection

▶ Definition
- Maximize distance
- Find points furthest from centroid

▶ Use Case
- Network security
  - Anomaly detection

▶ Limitation
- Nb variable
- Interconnection

Annealing or Simulated Quantum Annealing (SQA)

Access Control Management

▶ Definition
  – Minimize cost function

▶ Use case
  – Access Control Management
    • affect right people to right role

▶ Limitation
  – Nb variable
  – Interconnection

EVIDEN
an atos business

Questions

Denis Gerrer,
Head of Quantum Computing Business Development , Eviden
denis.gerrer@eviden.com