Kathrin Spendier
Promoting factual understanding of quantum computing | Quantum Technology Evangelist / Technical Advoc⋯
3w

❓ Ever wondered how Neural Networks (NNs) could revolutionize **#quantum** research?

#NeuralNetworks aren't just transforming **#AI** —they're also pivotal in the quantum realm!

In the work entitled "Parameter Estimation by Learning Quantum Correlations in Continuous Photon-Counting Data Using Neural Networks." **Quantinuum** proudly collaborated with global partners, such as the **Universidad Autónoma de Madrid**, **Chalmers University of Technology**, and the **University of Michigan**, uniting expertise from every corner of the world. 🌍
https://lnkd.in/gj8qttdN

🔍 Key Findings:
1️⃣ The study introduces a novel inference method employing artificial neural networks for quantum probe parameter estimation.
2️⃣ This method leverages quantum correlations in discrete photon-counting data, offering a fresh perspective compared to existing techniques focusing on diffusive signals.
3️⃣ The approach achieves performance on par with Bayesian inference - renowned for its optimal information retrieval capability - yet does so at a fraction of the computational cost.
4️⃣ Beyond efficiency, the method stands robust against imperfections in measurement and training data.
5️⃣ Potential applications span from quantum sensing and imaging to precise calibration tasks in laboratory setups.

🤔 Curious About the Unknowns? The authors are sharing EVERYTHING on Zenodo! 🎉

The codes used to generate these results, including the proposed NN architectures as TensorFlow models, are available here
https://lnkd.in/gVdzJycM
as well as all the data necessary to reproduce the results openly available here:
https://lnkd.in/gVdzJycM

Enrico Rinaldi, **Manuel González Lastre**, **Sergio Garcia Herreros**, **Shahnawaz Ahmed**, **Maryam Khanahmadi**, **Franco Nori**, and **Carlos Sánchez Muñoz**
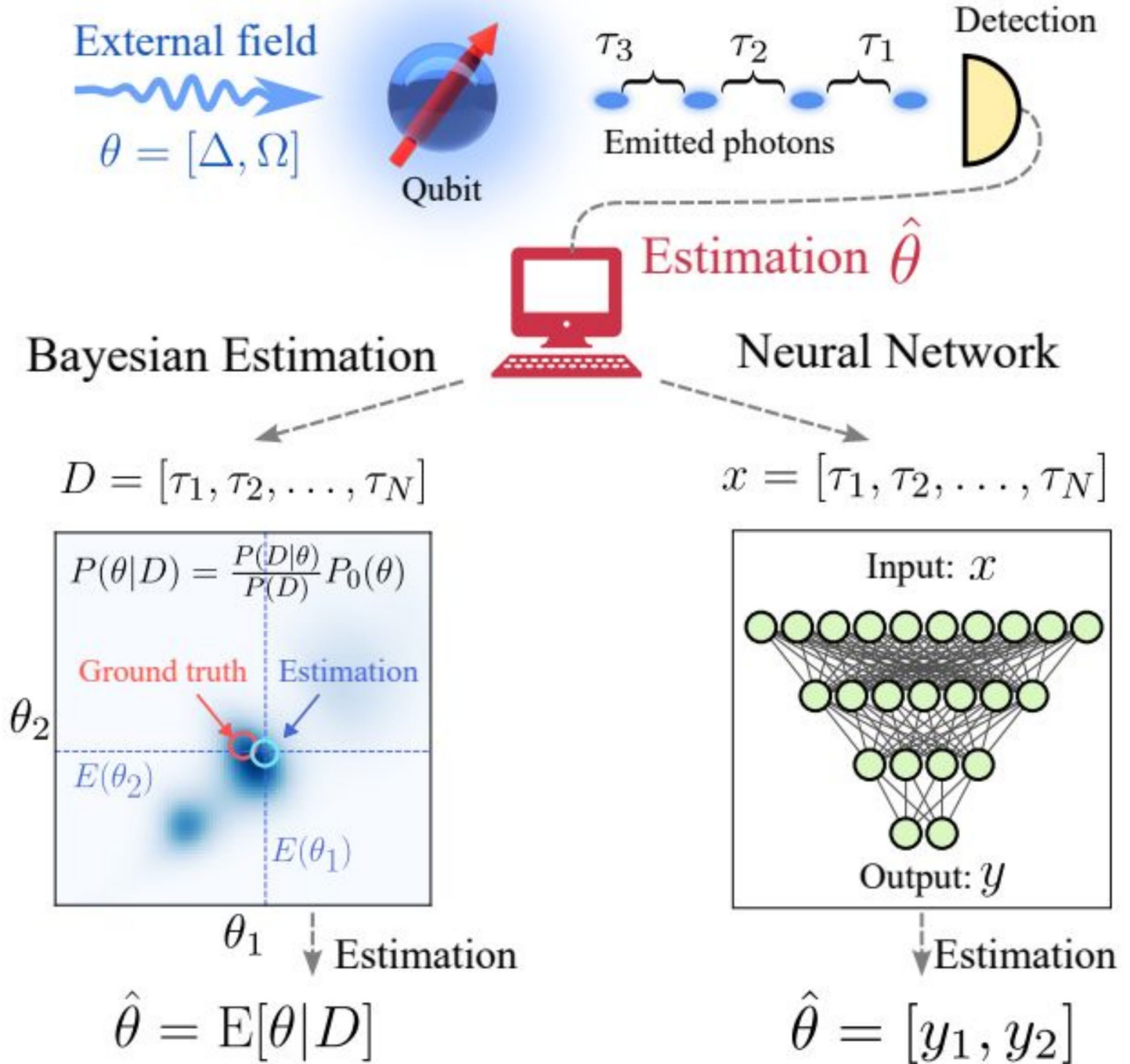
FIG. 1. **Quantum parameter estimation strategies in open quantum systems.**

Like   Comment

Kathrin Spendier   3w
Promoting factual understanding of quantum computing | Quantum Technology Evangelist / Technical Advoc⋯

paper link:
https://scirate.com/arxiv/2310.02309

Like ·   Reply | 3 Reactions

Seth Joslin   2w
Software Engineer with a passion for emerging tech and physics. Not afraid to ask dumb questions.

Is this an alternative method for QPE?

Like ·   Reply │ 1 Reaction

Isht Vibhu   3w
Associate Professor at Y D PG College,Lakhimpur Kheri

wonderful.

Like ·   Reply │ 1 Reaction

See more comments

. . .

Seth Joslin   2w
Software Engineer with a passion for emerging tech and physics. Not afraid to ask dumb questions.

Is this an alternative method for QPE?

Like ·   Reply │ 1 Reaction

Isht Vibhu   3w
Associate Professor at Y D PG College,Lakhimpur Kheri