Department of Computer Science, The University of Hong Kong

Quantum Information Seminar

Quantum communication with limited resources

Dr. Borivoje Dakić
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University of Vienna

Date:
July 17, 2019
Wednesday
2:00-3:00pm

Venue:
Room 328
Chow Yei Ching Building
The University of Hong Kong

Abstract:

Generally speaking, communication is the process of transmitting a message (information) from a sender to a receiver. When the distant parties use a single classical particle to communicate, they are restricted to “one-way signaling”, as the particle can carry information in one direction only. In this talk, I will analyze the corresponding quantum scenario, where the parties communicate via a single quantum particle prepared in superposition of different spatial locations. Surprisingly, I will show that such a scenario results in “multi-way signaling”, which is impossible in classical physics. Our framework [1, 2] does not assume (a priori) the use of quantum entanglement, in contrast to majority of known quantum information tasks and protocols. These findings bring novel insights into quantum information processing, ranging from foundational to practical.

[1] F. del Santo and B. Dakić, Two-way communication with a single quantum particle, Phys. Rev. Lett. 120, 060503 (2018),
[2] F. Massa, A. Moqanaki, F. Del Santo, B. Dakić, and P. Walther, Experimental two-way communication with one photon, arXiv:1802.05102 (2018).

About the Speaker:

Borivoje Dakić is an assistant professor at the Faculty of Physics at the University of Vienna. He obtained his PhD degree in Physics at the University of Vienna. After being a postdoc at the Centre for Quantum Technologies in Singapore and Oxford University, UK, he returned back to Vienna to run an independent research. Since 2016 he is a member of the Foundational Question Institute (FQXi). His expertise lies in the quantum information theory, entanglement characterization and quantum foundations.

All are welcome!
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