



Fakultät für Ingenieurwissenschaften, Informatik und Psychologie

Informatik-Fachvortrag

Dienstag, den 8. September 2026, 11:00 Uhr

Universität Ulm, Oberer Eselsberg

Gebäude O27, Raum 531

Herr Prof. Dr. Steve Fenner

University of South Carolina

spricht zum Thema

Strong parallel repetition failure in the Quantum Cloning Game

In the quantum cloning game, two collaborating players, Alice and Bob, share an initial quantum state ρ with a referee R . R flips a coin and chooses to challenge one of Alice or Bob uniformly at random. R announces their choice to both players, who are then not allowed to communicate with each other. Alice and Bob can then each apply an arbitrary channel to the portion of ρ in their possession in the hope that the challenged player ends up being entangled with R . This game has applications in quantum cryptography, particularly, quantum position verification, where a person wishes to prove to other parties that they are at a specific point in space.

Colisson Palais, Escolà-Farràs, & Speelman (TQC 2025, arXiv:2410.22157) show that for a single play of the game, Alice's and Bob's optimal success probability is exactly $3/4$, given a lower bound if $(3/4)^n$ on n parallel repetitions.

We show that this lower bound is not tight. In fact, for $n=2$, Alice and Bob can succeed with probability $(5+\sqrt{17})/16 > 9/16$. Thus strong parallel repetition fails for this game. We also improve the upper bound given in their paper for all n .

Joint work with Eli Naig.

Es laden ein die Dozenten der Fakultät für Ingenieurwissenschaften, Informatik und Psychologie.

Ulm, den 07.09.2026

gez. Prof. Dr. Enno Ohlebusch