SCUOLA NORMALE SUPERIORE

RELAZIONE ATTIVITA' ANNUALE DEI PERFEZIONANDI/DOTTORANDI – TERZO/QUARTO ANNO
REPORT ON THE PHD ACTIVITY – THIRD/FORTH YEAR

NOME E COGNOME NAME AND SURNAME	Farzad Kianvash
DISCIPLINA PHD COURSE	Nanoscience

CORSI FREQUENTATI CON SOSTENIMENTO DI ESAME FINALE ATTENDED COURSES (WITH FINAL EXAM)	VOTAZIONE RIPORTATA MARK	NUMERO DI ORE HOURS

CORSI FREQUENTATI SENZA SOSTENIMENTO DI ESAME FINALE ATTENDED COURSES (ATTENDANCE ONLY)	NUMERO DI ORE HOURS

ALTRE ATTIVITÀ FORMATIVE (SEMINARI, WORKSHOP, SCUOLE ESTIVE, ECC.) – DESCRIZIONE OTHER PHD ORIENTED ACTIVITIES (SEMINARS, WORKSHOPS, SUMMER SCHOOLS, ETC) – DESCRIPTION	NUMERO DI ORE HOURS
TQC 2020 http://tqc2020.lu.lv/	

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ATTIVITÀ DI RICERCA SVOLTA (MAX. 8.000 CARATTERI)* RESEARCH ACTIVITY (MAX. 8000 CHARACTERS)
This year we continued our research on the Flagged extension of a Quantum Channel (FQC). The orthogonal FQCs were studied vastly before, and we contributed to this topic by analysing non-orthogonal FQCs. First, we published "Marco Fanizza, Farzad Kianvash, and Vittorio Giovannetti, Phys. Rev. Lett. 125, 020503" which makes use of non-orthogonal FQC to find new upper bounds on the quantum capacity of depolarizing channel. Our new bounds were the tightest upper bound on the quantum capacity of depolarizing channel. In the next article "Farzad Kianvash, Marco Fanizza, and Vittorio Giovannetti, Bounding the quantum capacity with flagged extensions (on arxiv)" we generalized the ideas and found sufficient conditions on the degradability of flagged extension of convex combination of other channels. This is a quite general result and we applied our techniques to find upper bounds on the quantum capacities of depolarizing channel, generalized amplitude damping channel, and BB84 channel. All of our upper bounds are the tightest available upper bounds for these channels. In addition, I presented our work "Marco Fanizza, Farzad Kianvash, and Vittorio Giovannetti, Phys. Rev. Lett. 125, 020503" on TQC 2020 as a contributed talk, TQC is one of the most prestigious conferences in Quantum Information.

*se si intende sottoporre una relazione di ricerca più estesa, utilizzare il campo per una descrizione sintetica e allegare il documento in formato .pdf

If you are going to submit a longer report, please fill the box with a synthetic abstract and attach a document in pdf format

EVENTUALI PUBBLICAZIONI PUBLICATIONS (IF AVAILABLE)
Marco Fanizza, Farzad Kianvash, and Vittorio Giovannetti, Phys. Rev. Lett. 125, 020503
Farzad Kianvash, Marco Fanizza, and Vittorio Giovannetti, Bounding the quantum capacity with flagged extensions (arxiv)

NOME DEL RELATORE

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THESIS ADVISOR
Professor Vittorio Giovannetti.

DATA DATE	18/10/2020	FIRMA SIGNATURE	