Curriculum Vitae

Danila Dmitrievich Cherkashin

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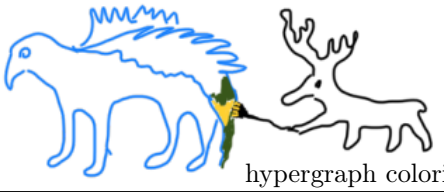
Main areas of expertize



hypergraph colorings

Steiner trees

Work expirience

Reseacher at
- Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS), 2022–2024+
- Saint-Petersburg University (SPbU), 2015–2023
- Moscow Institute of Physics and Technology (MIPT), 2016–2021
- St. Petersburg Department of Steklov Mathematical Institute of Russian Academy of Sciences (PDMI RAS), 2021–2023

Education and training

Specialist diploma — SPbU, 2015 — thesis "Weak forms of shadowing in topological dynamics" under the supervision of S. Kryzhevich.
PhD thesis "Extremal problems in hypergraph colorings" under the supervision of A. Raigorodskii and F. Petrov, defended at PDMI RAS, 2018

Personal skills

mother tongue: Russian
other languages: appropriate English
other skills: LaTeX typesetting

Scientific activities
Publications

More than 15 papers in WoS and Scopus
Selected papers:

A note on random greedy coloring of uniform hypergraphs (with J. Kozik), Random Structures & Algorithms 47 (3), 407–413, 2015. Let $r \geq 2$ be a fixed integer. In this paper we combine Pluhar's greedy approach with a random coloring to show that every n-uniform hypergraph with at most $c\left(\frac{n}{\ln n}\right)^{\frac{r-1}{r}} r^n$ edges has a proper r-coloring.

On the horseshoe conjecture for maximal distance minimizers (with Y. Teplitskaya), ESAIM: Control, Optimisation and Calculus of Variations 24 (3), 1015–1041, 2018. We prove that a set of maximal distance minimizers of a smooth convex closed curve with small curvature consists only of horseshoes (a horseshoe is the union of an arc and two tangent segments to the ends of the arc).

Regular behavior of the maximal hypergraph chromatic number (with F. Petrov), SIAM Journal on Discrete Mathematics 34 (2), 1326–1333, 2020. Let $m(n,r)$ denote the minimal number of edges in an n-uniform hypergraph which is not r-colorable. We prove that for any fixed n the sequence $a_r := \frac{m(n,r)}{r^n}$ has a (positive) limit, which was conjectured by Alon. We also prove the list colorings analogue of this statement.

Extremal problems in hypergraph colourings (with A. Raigorodskii), Russian Mathematical Surveys 75 (1), 89–146, 2020. This is a survey with the main focus on the results obtained during the last decade.

Lovász theta approach to eventown problem (with M. Antipov), Linear Algebra and its Applications 655, 302–313, 2022. We apply Lovász bound on the independence number of a graph to show that a family of vectors in $\mathbb{Z}_k^n$ which is pairwise orthogonal and self-orthogonal (modulo k) has at most $k^{n/2}$ members.

15.03.2023 sign