

CURRICULUM VITAE

**STOYAN DIMITROV**

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Research Interests

- Enumerative and Algebraic Combinatorics.
- Probability, Statistics and Machine Learning.
- Algorithms

Education

**University of Illinois at Chicago**

Ph.D. Candidate, Mathematics & Computer Science

*Advisor: Bridget Tenner*

expected May 2022

(2017 - on leave)

**Sofia University, Bulgaria**

M.Sc., Probability and Statistics

- *summa cum laude*

April 2014

**Sofia University, Bulgaria**

B.Sc., Computer Science

- *magna cum laude*

September 2012

Honors and Awards

- UIC MSCS Graduate Student Teaching award 2020
- Mirror of the Putnam competition (for students outside US) 2014 - 3rd prize.
- IMC (International Mathematical Competition) 2012 - Honorable mention
- Bulgarian National Mathematical Olympiad for University Students 2011, 2013 - Gold Medal.
- Award “academician Borislav Bojanov” for Mathematics 2014 (given to one Bulgarian student).
- Scholarship “Nikola Obrechhoff” for Mathematics 2012 (given to one Bulgarian student).

## Publications

7. **Moments of permutation statistics and central limit theorems** (with N. Khare)  
27 pages, arXiv:2109.09183
6. **Digraphs with exactly one Eulerian tour** (with L. Grisales, A. Labelle and R. Posada)  
10 pages, “Journal of Integer Sequences”, under final review, arXiv:2104.10734
5. **Sorting by shuffling methods and a queue**  
29 pages, “The Electronic Journal of Combinatorics”, under final review, arXiv:2103.04332
4. **On permutation patterns with constrained gap sizes**  
26 pages, submitted, arxiv:2002.12322
3. **Adaptive Monte Carlo algorithm for Wigner kernel evaluation** (with V. Todorov, I. Dimov and R. Georgieva)  
12 pages, Neural Computing and Applications, 2019: 1-12.
2. **Branching processes in continuous time as models of mutations** (with M. Bojkova and P. Trayanov)  
14 pages, Computational Statistics & Data Analysis 113, 111-124, 2017.
1. **Reinforcement learning based algorithm for the maximization of EV charging station revenue** (with R. Lguensat)  
5 pages, International Conference on Mathematics and Computers in Sciences and in Industry, 2014.

### In preparation:

4. **The power-free subset problem**  
(communicated with Noga Alon, Mark Lewko and others)
3. **A new nonparametric test for detection of seasonality in time series**
2. **Riordan array transformations between lattice path and power sequences**  
with Sheila Sundaram et al.
1. **Explanations to some Chess tableaux phenomena**  
with Antoine Labelle

## Research Talks

<b>Joint Mathematics Meeting (JMM) 2022, Seattle, Washington,</b>	Jan 2022
<i>“Moments of permutation statistics and central limit theorems”</i>	
<b>Open University, Discrete Mathematics Seminar</b>	Nov 2021
<i>“Moments of permutation statistics and central limit theorems”</i>	
<b>UC Berkeley, Combinatorics seminar</b>	Nov 2021
<i>“Moments of permutation statistics and central limit theorems”</i>	

<b>Rutgers University</b> , Experimental Mathematics Seminar <i>“Moments of permutation statistics and central limit theorems”</i>	Oct 2021
<b>EUROCOMB 2021</b> <i>“Sorting by shuffling methods and a queue”</i>	Sept 2021
<b>Graduate Research Workshop in Combinatorics (GRWC) 2021</b> <i>“The problem of power-free subsets”</i>	Jun 2021
<b>TU Vienna</b> , Arbeitsgemeinschaft Diskrete Mathematik seminar <i>“Sorting by shuffling methods and a queue”</i>	Jun 2021
<b>Dartmouth College</b> , Combinatorics Seminar <i>“Sorting by shuffling methods and a queue”</i>	May 2021
<b>Graduate Student Combinatorics Conference (GSCC) 2021</b> , Problem Session <i>“Inequality implying a Central Limit Theorem”</i>	Apr 2021
<b>University of Illinois at Chicago</b> , Math Club <i>“Problems and facts in Enumerative Combinatorics”</i>	Apr 2021
<b>Permutation Patterns 2020</b> <i>“On Permutation Patterns with constrained gap sizes”</i>	Jun 2020
<b>Andrews University</b> , Eigen seminar, Department of Mathematics <i>“On Permutation Patterns with constrained gap sizes”</i>	Feb 2020
<b>University of Illinois at Chicago</b> , Graduate Combinatorics seminar <i>“The problem of power-free subsets”</i>	Oct 2019
<b>University of Illinois at Chicago</b> , Graduate Combinatorics seminar <i>“A short bijective proof of Cayley’s formula”</i>	Sep 2018
<b>University of Bonn</b> , Research Institute for Discrete Mathematics, Oberseminar <i>“New bounds for the vertex Folkman number <math>F(2_7; 5)</math>”</i>	Jan 2015
<b>ETH Zurich</b> , Institute of Theoretical Computer Science, Mittagsseminar <i>“New bounds for the vertex Folkman number <math>F(2_7; 5)</math>”</i>	Oct 2014
<b>Sofia University</b> , Mathematics seminar of prof. Emil Horozov <i>“Polya’s enumeration method”</i>	Dec 2013

\* All research talks in 2020 and 2021 were given online.

### Attended conferences

Joint Mathematics Meeting (JMM) 2022	Jan 2022
EUROCOMB 2021	Sept 2021
“Combinatorics and algebras from A to Z”, in honor of A. Regev and D. Zeilberger	Jul 2021
28th British Combinatorial Conference (BCC)	Jul 2021
Graduate Research Workshop in Combinatorics (GRWC) 2021	Jun 2021
AofA2021, Klagenfurt, Austria	Jun 2021

Permutation Patterns 2021 Virtual Workshop	Jun 2021
Graduate Student Combinatorics Conference (GSCC)	Apr 2021
Joint Mathematics Meetings (JMM) 2021,	Jan 2021
Algebra, Geometry and Combinatorics Day (ALGECOM XX) 2020	Dec 2020
Permutation Patterns 2020 Virtual Workshop	Jun 2020
Joint mathematics meetings (JMM) 2020 Denver, Colorado, USA	Jan 2020
Foundations of Data Science Summer School, Georgia Institute of Technology	Aug 2019
Permutation Patterns 2019, University of Zurich	Jun 2019
6th Lake Michigan Workshop on Combinatorics and Graph Theory, Kalamazoo	Apr 2019
Random Graphs, Geometry and Asymptotic Structure, University of Birmingham	Aug 2013
Preparatory course with the Bulgarian National Team of Mathematics, Sofia	Jul 2007

\* All conferences in 2020 and 2021 were attended online.

## Teaching Experience

- at University of Illinois at Chicago:
  - MCS 401: Computer Algorithms I (grader)
  - MCS 275: Programming Tools and File Management (with Python)
  - MATH 310: Applied Linear Algebra (grader)
  - MATH 180: Calculus I
  - MATH 121: Precalculus
  - MATH 118: Mathematical Reasoning
  - MATH 110: College Algebra
  - MATH 090: Intermediate Algebra
  - STAT 101: Introduction to Statistics
- at Sofia University:
  - Discrete Mathematics (1 semester)
  - Probability and Statistics (2 semesters)
  - Information Theory (2 semesters)
  - Design and Analysis of Algorithms (2 semesters)
  - Calculus I (1 semester)

## Employment

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<b>Man AHL, London</b> Quantitative Researcher Intern - Machine Learning	05/2020 - 06/2020
<b>WorldQuant LLC, Sofia</b> Quantitative Researcher Intern	07/2017 - 01/2018
<b>University of Illinois at Chicago</b> Teaching Assistant	05/2015 - present
<b>Telecom Bretagne, Rennes, France</b> Research Intern	07/2013 - 10/2013
<b>Sofia University</b> Teaching Assistant	05/2011 - 05/2015

### Professional Services

- Mentoring Undergraduate Research Projects:
  - “Proofs for 50+ of the bijective proof problems of R. Stanley” 06/2020 - 07/2020  
Students: Luz Grisalez (MIT), Rodrigo Posada (MIT).
  - “Digraphs with exactly one Eulerian tour” 07/2020 - 09/2020  
Students: Luz Grisalez (MIT), Rodrigo Posada (MIT),  
Antoine Labelle (McGill University).
  - “Chess tableaux and representation theory” 08/2021 - present  
Students: Antoine Labelle (McGill University).
  - “Book on less-known problems in discrete mathematics” 10/2019 - present  
Students: Miroslav Marinov (University of Oxford).
- Volunteer judge, International Tournament of Young Mathematicians (ITYM), Sofia, Bulgaria, 2015.
- Volunteer mentor for QED - Chicago’s youth math symposium, 2021.
- Co-organizer of the UIC Graduate Combinatorics and Theoretical Computer Science seminar, Fall 2019.
- Referee: “Journal of Integer Sequences”.

### Professional Memberships

- American Mathematical Society (AMS) - member since 2015
- Mathematical Association of America (MAA) - member since 2015
- Association of Christians in the Mathematical Sciences (ACMS, member since 2020)