Michał Pawłowski

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Born 20 May 1996

EDUCATION

2021 – present

PhD studies in Computer Science

Under supervision of associate professor Piotr Sankowski
University of Warsaw, Faculty of Mathematics, Informatics and Mechanics

2019 – 2021

Master's degree in Computer Science

University of Warsaw, Faculty of Mathematics, Informatics and Mechanics

- Thesis: Matroid optimization under uncertainty
- Seminar: Algorithmics
- Average of grades obtained during the studies: 5,00
- Final MSc studies grade: 5, Summa cum laude

2015 – 2019

Bachelors's degree in Computer Science

University of Warsaw, Faculty of Mathematics, Informatics and Mechanics

- Thesis: Portfolio Optimisation using Neural Networks and Monte Carlo Graph
- Average of grades obtained during the studies: 4,48
- Final BSc studies grade: 4,5

2015 – 2018

Bachelors's degree in Mathematics

University of Warsaw, Faculty of Mathematics, Informatics and Mechanics

- Thesis: Recurrence of Random Walks on Some Structures
- Proseminar: Probability theory
- Average of grades obtained during the studies: 4,65
- Final BSc studies grade: 5, Summa cum laude

WORK EXPERIENCE

November 2021 – present

Doctoral Researcher (full-time)

IDEAS NCBR, Warsaw

I joined a team of three researchers: two post-docs and a professor. We worked on a new research direction for the Min-cost Perfect Matching with Delays (MPMD).

In the original version of this problem, we are given an n-point metric space, where requests arrive in an online fashion. Moreover, we are allowed to postpone pairing arriving request for time t at a delay cost t. For this reason, the goal of the MPMD is to minimise the overall sum of distance and delay costs of created perfect matching. Interestingly, it is proved that in the standard case of the adversarially generated requests, no online algorithm can achieve a constant competitive ratio.

At IDEAS, we considered a stochastic version of the MPMD problem — we assumed that the input requests follow a Poisson arrival process. For such a problem, we have proved that the above lower bound could be improved by presenting two deterministic online algorithms, which, in expectation, are constant competitive. My task here was to find a better way to estimate the cost of this optimal solution and contribute to the approximation algorithms design.

October 2018 – June 2019

Machine Learning Engineer Intern (part-time)

AI Investments, Warsaw

I worked on a team of four students. Our year-long effort resulted in developing a tool allowing investors to optimize their financial portfolios based on historical data and future predictions. My responsibilities included grid search implementation, analysis of graph traversal algorithms, code reviews and workflow coordination.

RESEARCH PROJECTS

October 2020 – September 2021

Scholarship in Polish National Science Centre's SONATA grant

Project title: Combinatorial Optimization Under Uncertainty: matroids, matchings and submodular functions

Project manager: dr Marek Adamczyk

During my research, I worked on the k-matroid Prophet Inequality problem. I considered both the model with the adversarial order of the elements and the random order one, also known as the k-matroid Prophet Secretary. However, I focused my research only on a subclass of matroids called transversal matroids. The results I obtained include an $(1-e^{-k})/k$ approximation algorithm for the k-transversal matroid Prophet Secretary and an $1/(k+1)$ approximation for the k-transversal matroid Prophet Inequality.

HONORS AND AWARDS

January 2022

Honourable mention in the LV Competition for the Best Student Thesis in the Theory of Probability and Applications of Mathematics

Issued by: Polish Mathematical Society

January 2021

Rector's Scholarship Laureate

Issued by: University of Warsaw

Scholarship for students, who maintain continuity of studies and obtain a high GPA during the preceding year, have significant scientific achievements, have significant artistic achievements or have achievements in sport on a national and/or international level.

January 2018

Rector's Scholarship Laureate

Issued by: University of Warsaw

SKILLS

Languages Polish – Native
English – B2

Typesetting LaTeX

ADDITIONAL INFORMATION

Research interests Prophet inequalities for both adversarial and random arrival models, stochastic probing, stochastic online matchings with delays and related problems