

**Pre-doctoral research position
in the scientific project
“BOBR: Decomposition methods for discrete problems”
financed by the European Commission (grant agreement no 948057)
Principal Investigator: Michał Pilipczuk**

The ERC project „BOBR: Decomposition methods for discrete problems”, led by dr Michał Pilipczuk, is offering a pre-doctoral research position in the Institute of Informatics at the Faculty of Mathematics, Informatics and Mechanics of the University of Warsaw.

Terms of employment

Selected candidate will be employed on a fixed-term basis of 48 months, starting on 1st of October 2021, as pre-doctoral researcher (*pol.* asystent). The remuneration for the position combined (basic salary approx. 4 000 PLN gross/month plus project bonus) is around 6 000 PLN per month pre-tax (around 1 325 EUR). Salary is additive to the standard PhD scholarship. The position comes with no teaching obligations and a generous travel budget. Selected candidate will work on problems in the intersection of the fields of structural graph theory, algorithm design, and logic in computer science.

Description of the project

Project BOBR focuses on studying graph decompositions and their applications in designing efficient algorithms, in particular for graph problems and problems originating from finite model theory. The work within the project will concentrate on the following four directions:

- Beyond Sparsity. We will study the abstract notions of sparsity in graphs (bounded expansion and nowhere denseness) in order to understand the structure implied by these notions and to use this structure for designing efficient algorithms. We will also try to build a theory of well-structured dense graphs, based on advances in the theory of sparse graphs and inspired by the theory of stability.
- Dynamic parameterized data structures. We will use the idea of parameterization to perform a systematic exploration of data structures for dynamic parameterized problems in graphs.
- Algorithms in planar graphs. We will design new parameterized and approximation algorithms for problems in planar graphs, while focusing on combining techniques from both these areas.
- Algorithms in hereditary classes of graphs: We will study structural properties in classes of graphs defined by forbidding induced subgraphs, in order to design efficient parameterized, approximation, and exact algorithms working on graphs from such classes.

Requirements

We expect that the candidate at the moment of employment holds a master degree in either mathematics or computer science, pursues a PhD degree in one of these disciplines, and has an excellent background in both of them. A good understanding of fundamental theoretical concepts and results in one or more of the following fields is required:

- structural graph theory;
- algorithm design;

- automata and logic.

More specifically, the candidate should have experience, either through coursework or actual research, in one or more of the following areas:

- parameterized algorithms;
- approximation schemes in planar graphs;
- algorithms on graph classes;
- dynamic data structures;
- model-checking algorithms;
- finite model theory;
- structural theory of sparse graphs (notions of bounded expansion and nowhere denseness);
- decompositions of graphs, in particular treewidth, cliquewidth, treedepth, or twin-width.

Applications

An application should include **Curriculum Vitae** that:

- presents an overview of background and scientific achievements of the candidate, and
- lists all the candidate's research works (including not yet published manuscripts).

The Curriculum Vitae should be supplied with a copy of **Master's degree** (or information on the status of the thesis and the expected graduation date, if the applicant did not defend yet at the moment of submitting the application) and **transcript of all the coursework** done by the candidate (including the obtained grades). The candidates are also asked to provide an at most one page long **research statement** which concisely describes candidates' research work, both past and present. This statement should describe all currently on-going projects and collaborations.

In addition to the above, there should be a **signed cover letter** addressed to the Dean of the Faculty of Mathematics, Informatics and Mechanics, University of Warsaw together with the **personal data clause** (attached).

Applications, as well as further questions on both the scientific topic of the project and on formal details of the call procedure should be directed to dr Michał Pilipczuk:

`michal.pilipczuk@mimuw.edu.pl`

In order to apply for the position, candidates should send an e-mail and submit the documents as attached .pdf files.

Application deadline: 28 August 2021

Applications which do not satisfy the above requirements or are submitted after the deadline will not be considered for the position.

The applications will be evaluated by a selection committee appointed by the Dean of the Faculty of Mathematics, Informatics and Mechanics, University of Warsaw. The committee may invite candidate to a meeting, which will be conducted remotely. The results of the competition will be sent to candidates electronically on 8 September 2021 at the latest. The competition is the first stage of the recruitment process as described in the Statute of the University of Warsaw, the recommendation by the selection committee being a basis for its subsequent stages.

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given and family name

Information on personal data processing

Controller

Controller of your personal data processed in connection with the recruitment process is the University of Warsaw, ul. Krakowskie Przedmieście 26/28, 00-927 Warszawa, as the Employer.

Contact with the controller:

- by traditional mail at: University of Warsaw, ul. Krakowskie Przedmieście 26/28, 00-927 Warszawa (name the organizational unit to which your letter is addressed);
- by phone: 22 55 20 355.

Data Protection Officer (DPO)

Controller has designated Data Protection Officer whom you may contact via email at iod@adm.uw.edu.pl. You may contact the DPO in all matters relating to your personal data processing by the University of Warsaw and the exercise of rights in relation to the processing of personal data.

The DPO, however, does not proceed other matters, like handling recruitment procedures, collecting recruitment documents, providing information on current recruitment process.

Purpose and legal grounds of data processing

Personal data of candidates for employment shall be processed for recruitment purposes only.

Your personal data shall be processed in the scope as indicated by employment law¹ (*given name (names) and family name, date of birth, contact information as provided, education, professional qualifications, previous employment*) for the purposes of this recruitment process², whereas other data³ shall be processed based on your consent which may take the following wording:

I agree to the processing of personal data provided in CV and other submitted documents by the University of Warsaw for realising my recruitment process.

If your documents include data as mentioned in Art. 9 section 1 of the GDPR (special categories of personal data), processing shall be possible upon your consent to processing such data⁴ which may take the following wording:

I agree to the processing of special categories of personal data, as mentioned in Art. 9 section 1 of the GDPR, provided in CV and other submitted documents) by the University of Warsaw for realising my recruitment process.

The University of Warsaw shall be also processing your personal data in future recruitment processes upon your consent⁵ which may take the following wording:

¹ Art. 22¹ of the law of June 26, 1974 Labour Code (i.e. Journal of Laws 2019 item 1040 with subsequent changes);

² Art. 6 section 1 letter b of the Regulation of the European Parliament and the Council (EU) 2016/679 of April 27, 2016 on protection of individual persons with regard to the personal data processing and on the free flow of such data, and also repealing Directive 95/46/EC (general regulation on data protection) (Official Journal EU L 119 of 04.05.2016, page 1, with subsequent changes) (hereinafter as the GDPR);

³ Art. 6 section 1 letter a of the GDPR;

⁴ Art. 9 section 2 letter a GDPR;

⁵ Art. 6 section 1 letter a GDPR;

I consent to processing of my personal data for the purposes of any future recruitment processes at the University of Warsaw for the period of the next nine months.

You may revoke all such consents at any time by, for example, sending an email at michal.pilipczuk@mimuw.edu.pl.

Be advised that the revocation of your consent does not affect legal compliance of processing which had been completed upon consent before its revocation.⁶

Data retention period

Your personal data collected in this recruitment process shall be stored over the period of three months from the date the recruitment process is completed.

In case you agree to process your data in future recruitments, your data shall be used over the period of nine months.

Data recipients

Officers authorized by the Controller shall have access to your personal data, the processing of which is in the scope of their duties.

~~Recipients of personal data may be other subjects obligated by the Controller to provide specific services involving data processing, like~~

.....
~~(name all recipients of data)~~

Data transfer outside the European Economic Area (EEA)

Your personal data shall be disclosed to subjects authorized by law. Signing-in is through Google Forms. Your personal data may be also processed by our provider of G-Suit for education by Google Company in their data processing centres.⁷ Your data shall be protected under the standards of the Privacy Shield, accepted by the European Commission.⁸ This shall guarantee an adequate level of data security.

Rights of the data subject

Under the GDPR data subjects have the following rights:

- to access data and to receive copies of the actual data;
- to correct (rectify) your personal data;
- to restrict processing of personal data;
- to erase personal data, subject to provisions of Art. 17 section 3 of the GDPR;
- to file a claim with the President of the Personal Data Protection Office, if you believe data processing violates law.

Information on the requirement to provide data

Providing your personal data in the scope resulting from law is necessary to participate in the recruitment process. Providing other personal data is voluntary.

.....
place and date

.....
applicant's signature

⁶ Art. 7 section 3 GDPR;

⁷ <https://www.google.com/about/datacenters/inside/locations/index.html>

⁸ <https://www.privacyshield.gov>