

Project: *[INTENCITY] High-throughput high-resolution quantitative phase microscopy and tomography with spatiotemporal coherence engineering for non-invasive single-cell analysis*

Principal Investigator: prof. Maciej Trusiak

Position in the Project: PhD student.

Number of positions: 2.

Institution: Institute of Micromechanics and Photonics, Faculty of Mechatronics, Warsaw University of Technology.

Requirements:

1. BSc degree in Physics, Engineering, Optics, Computer Science, Biomedicine or similar. Enrollment to the Doctoral School of WUT.
2. Good knowledge of Matlab and/or Python or other software environments. Algorithmic background in optical information processing is preferable.
2. Experience in optics and microscopy is preferable.
3. Fluent spoken and written English.
4. Strong motivation and passion for scientific work (theoretical and/or numerical and/or experimental) both independently and as part of a team in an interdisciplinary environment, with the ability to creatively propose solutions to problems at hand, pay close attention to detail and to meet deadlines.
5. Very good social skills.
6. Experience in dissemination of research results to the scientific community and establishing/participating in international cooperation are welcome.

General description of responsibilities:

Project Overview

This research aims to redefine label-free, quantitative phase imaging (QPI) by designing a high-throughput, high-precision imaging platform that captures detailed sub-cellular structures in live cell populations without phototoxic dyes. By combining interferometric and non-interferometric approaches, this project will address critical biomedical needs, allowing researchers to examine dynamic cell behaviors within large colonies, from the population scale down to individual cell phenotyping.

Primary Goals

1. **Advancement of Label-free Imaging Technologies:** Develop robust 2D and 3D phase imaging methods that achieve sub-cellular resolution across a large field of view (FOV) using techniques that minimize photodamage and reduce data requirements.
2. **Integration of Computational Imaging and Signal Processing:** Incorporate cutting-edge computational algorithms to support adaptive imaging tailored to a variety of live biological samples.
3. **Applied Research with Practical Impact:** Leverage the complementary expertise of Warsaw University of Technology in interferometric techniques and Nanjing University of Science and Technology in non-interferometric imaging to create a well-rounded, adaptable imaging approach. This collaboration will advance applied research in biomedical imaging, yielding a demonstrator of hybrid instrument capable of supporting high-content imaging in cell and tissue analysis, with a particular focus on diagnostics and therapeutic monitoring.

In practically and robustly combining innovative computational microscopy and advanced optical systems, this project aims to address the technical barriers in single-cell and population-level imaging, enabling biomedical to perform label-free high-content analysis across diverse research applications.

PhD students are expected to provide numerical and experimental help in achieving these goals. A successful dissemination of results to the scientific community is expected. Moreover, for PhD students co-supervising Master students will be required. Establishing and expanding international cooperation within the project will be most welcome.

What we offer:

1. Remunerated work in dynamic and competent scientific group with excellent research environment and international cooperation promoting publications in high impact journals.
2. Financial support for abroad scientific visits and attending conferences.
3. Encouragement and support in preparing grant applications and general career development.

Application deadline: 05.11.2024, 23:59.

Please submit the following documents to: maciej.trusiak@pw.edu.pl

Conditions of employment:

Salary: 2500 PLN/month with contracts for up to 36 months (easily negotiable).

Preferred time of starting position: November 2024.

Additional information required:

To apply, please send your application, including motivation letter and CV to the following e-mail address: maciej.trusiak@pw.edu.pl (deadline 05.11.2024).

We thank all applicants for their interest; however, only selected candidates may be invited for an interview. Applications will be accepted until the position is filled. If the winner of the competition resigns from signing the contract, we reserve the right to choose the next best person from the ranking list.

Due to the entry into force of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016, all candidates are requested to provide consent to the processing of his or her personal data by the institution which carries out the recruitment process.

Thus, please include in your application the following statement: "I hereby agree to the processing of my data included in the application documents by Warsaw University of Technology, Warsaw, Poland, to carry out the recruitment process."

Your personal data is processed on the basis of the Article 6 Part 1 Points (c) and (f) of the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (GDPR; Official Journal of the European Union L 119/1).