Project: *[PHAICELL] Coherent quantitative phase microscopy: revisiting the basics and proposing novel numerical reconstruction methods with applications for advanced label-free bio-imaging*

Principal Investigator: dr. Maciej Trusiak

Position in the Project: PhD student in the Faculty of Mechatronics, Warsaw University of Technology.

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

Requirements:
1. Master degree in Physics, Optics, Computer Sciences or Engineering.
2. Very good knowledge of Matlab, Python and C++ environments. Algorithmic background in optical information processing and applied optics.
2. Experience in coherent full-field optical measurement (holography, interferometry), microscopy and fringe pattern analysis.
3. Fluent spoken and written English.
4. Strong motivation and passion for scientific work (theoretical, numerical and 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, writing grant proposals and establishing international cooperation.

General description of responsibilities:
The project aims at investigating the limits of the quantitative phase imaging, pushing them via novel phase demodulation algorithm, and proposing new applications for biomedical imaging of live specimen. PhD Student will be responsible for
- studying the fundamental limits of quantitative phase microscopy,
- investigating the effects of low photon budget on quantitative phase imaging accuracy under various conditions,
- studying Bedrosian theorem violation,
- advancing numerical phase reconstruction methods and enhancing phase sensitivity and robustness to interferogram's artifacts,
- designing, developing, implementing, testing and optimizing novel 2D fast adaptive local iterative filtering method for local frequency-guided interferogram analysis enabling significantly increased SNR (signal-to-noise ratio) and SBP (space-bandwidth product) of quantitative phase reconstruction.

A successful dissemination of results to the scientific community is expected. Moreover, co-supervising Master students will be required. Establishing and expanding international cooperation within the project will be most welcomed.

What we offer:
1. Scholarship contract and competitive remuneration package.
2. Work in dynamic and competent scientific group with excellent research environment and international cooperation promoting publications in high impact journals.
3. Financial support of abroad scientific visits and attending conferences.
4. Encouragement and support in preparing grant applications.

Type of NCN Project: OPUS19 – ST.
Application deadline: 11.02.2021, 23:59. Results available on 15.02.2021.
Please submit the following documents to: maciej.trusiak@pw.edu.pl

Conditions of employment:
PhD scholarship: 4000 PLN/month (net salary), stipend contract for 36 months.
Preferred time of starting position: 1st March 2021.

Additional information:
Motivation letter (in English).
CV (in English).
Master thesis.
Contact details of the scientific supervisor and other referees (if available).

To apply, please send your application, including motivation letter, CV with the list of your publications and achievements, Master degree thesis alongside with contact information to the scientific supervisor and other referees (if available) to the following e-mail address: maciej.trusiak@pw.edu.pl until the 11.02.2021. Incomplete applications will not be considered.

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.