Project title:

Computational Methods in Quantum Optical Coherence Tomography

Position:

Scholarship Student

Number of positions: 1

City: Toruń

Website: https://www.fizyka.umk.pl/en/

Requirements:

- Master's Degree in Computer Science or Mathematics or Physics or a relevant discipline.
- Background in machine learning or programming.
- Knowledge of Optical Coherence Tomography or Quantum Optical Coherence Tomography preferred but not mandatory.
- Very good command of spoken and written English.

Description of duties:

The student's aim will be to develop and apply machine learning methods for advanced Quantum Optical Coherence Tomography (Q-OCT) systems, in particular for Fourier-domain Quantum OCT (Fd-Q-OCT) and Swept Source Quantum OCT (SS-Q-OCT). The student will work on the development, optimisation, training, and validation of neural network architectures for the removal of artefacts and dispersion effects from Q-OCT signals, as well as on methods for improving image resolution. The research will also include the preparation of realistic training datasets based on experimental and simulated data, development of automated training-data generation methods, and testing of machine learning models on experimental Q-OCT signals.

Tasks:

- Development and optimization of machine learning methods for processing Quantum OCT (Q-OCT) signals.
- Design, training, and testing of neural network architectures for artefact and dispersion removal in Fd-Q-OCT and SS-Q-OCT systems.
- Preparation and generation of training datasets based on experimental and simulated Q-OCT data.
- Development of automated methods for generating training data from experimentally acquired joint spectra.
- Validation of machine learning models on experimental Q-OCT signals.
- Development of neural-network-based methods for improving the resolution of Q-OCT images.

Competition type: Opus/

Field of science: ST

Application deadline: 25 June 2026, 23:59

Application form: e-mail

Employment conditions:

A scholarship in the amount of PLN 5,000 gross per month (PLN 6,500 gross per month after the mid-term evaluation) for a period of up to 48 months. The remuneration will amount to PLN 5,000 before the mid-term evaluation and PLN 6,500 after the mid-term evaluation.

Planned period of employment: up to 48 months **, 1 October 2026–30 September 2030**

Additional information:

The scholarship is awarded in accordance with the rules set out in the Regulations on the Award of Research Scholarships of the National Science Centre, adopted by Resolution No. 25/2024 of the Council of the National Science Centre dated 4 March 2024..

Required documents (please send these to the project manager's email address: kolenderski@fizyka.umk.pl, with the subject line 'Opus 29.1'):

- Cover letter
- CV
- Copies of obtained diplomas and certificates (if any)
- Copy or scan of candidate's publications (if any)
- Information about scientific awards, scholarships and other distinctions (if any)
- Description of current research activity (if applicable)
- Consent to the processing of personal data (https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.umk.pl%2Fuczelnia%2Fiod%2FKonkurs_EN.docx&wdOrigin=BROWSELINK).
- Certificate of student status

Applicants will be evaluated by a selection committee appointed by the Dean of the Faculty of Physics, Astronomy and Informatics. The committee will recommend the awarding (or rejection) of the scholarship no later than 26 June 2026.
Candidates will be notified of the outcome of the competition by e-mail.
In the event of resignation of the selected candidate, the right to indicate the next candidate from the ranking list is reserved.
All documents should contain the candidate's signature or its scan.
Language of application: Polish or English.