Prospective supervisor's form

Name of the supervisor: Małgorzata Szczerska

Academic title: Ph.D. D.Sc. E.Eng.

Orcid ID number: https://orcid.org/000 0003-4628-6158

Faculty of Electronics, Telecommunications and Informatics

Gdańsk University of Technology **Department of** Metrology and Optoelectronics

Phone: **+48** 347 13 61

E-mail: malszcze@pg.edu.pl

Personal web page: https://pg.edu.pl/ 30c9e61c56_malgorzata.jedrzejewska-szczerska/

Discipline[i] control, electronic and electrical engineering none

Optional

Key words (obligatory four key words describing research interests / expertise):

photonics

biophotonics

fiber optic sensors

biomedical optics

Bibliometric indicators

1. Number of journal publications in WoS/ Scopus 76/92
2. Citations excluding self-citations WoS 347 Scopus 487
3. Hirsch index WoS 15 Scopus 17

1. The number of PhD students who have graduated under your supervision: 1 (2 co-promoter)
2. The number of PhD students currently supervised:
   a. within the current doctoral school 0
   b. within doctoral studies (previous system) 3
3. Are you currently accepting new PhD students:
   a. Polish *Yes/No* Yes
   b. Foreign *Yes/No* Yes

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Research interests or topics offered for PhD research (no more than 2000 characters)[ii]

My main research area is biophotonics and I focus on the use of low-coherence interferometry, fiber-optic technology, and the application of optical measurements in biomedicine. Apart from my main research subject, I also deal with research in the areas of using low-coherence interferometry in metrology, designing and manufacturing of optical phantoms of biological tissues, and investigating the biocompatibility of new optoelectronic materials.
Topics offered for PhD research:
- the design and the construction of novel sensors with the fiber-optic microstructures
- the design and the construction of novel fiber-optic sensors with the use of the new carbon-based (e.g. diamond, DLC or graphene) and metal-based (e.g. ALD thin layers) materials
- the design and the construction of novel biosensors (e.g. biofunctionalization of the sensing layer of fiber optic sensors)
- label free detection of medicines (e.g. immunology drugs)
- the design and the manufacture of novel optical phantoms of biological tissues.

PhD students are required to perform the following tasks:
- literature study
- theoretical modelling/calculation
- design of physical models
- implementation of sensors
- measurement of metrological parameters of the sensor
- application of the sensors in biomedical measurements

Funding or special equipment needed to carry out a PhD project [iii]:

1. Is funding available for experimental work: *Yes/No/not needed* — Yes
2. Is the equipment needed to complete a PhD project available in your lab/department: *Yes/No/not needed* — Yes

Most important publications – no more than 5 published after 1.01.2018

No	Authors/title/journal	Number of points according to the current list of the Ministry of Science and Higher Education	Publication year
1.	Sękowska A., Majchrowicz D., Sabisz A., Ficek M., Bułło-Piontecka B., Kosowska M., Jing L., Bogdanowicz R., Szczerska M. / Nanodiamond phantoms mimicking human liver: perspective to calibration of T1 relaxation time in magnetic resonance imaging / Scientific Reports	140	2020
2.	Kosowska M., Majchrowicz D., Ficek M., Wierzba P., Fleger Y., Fixler D., Szczerska M. / Nanocrystalline diamond sheets as protective coatings for fiber-optic measurement heads, / CARBON	140	2020

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3.	Hirsch M., Listewnik P., Struk P., Weber M., Bechelany M., Szczerska M./ ZnO coated fiber optic microsphere sensor for the enhanced refractive index sensing / Sensors and Actuators A	100	2019
4.	Marzejon M., Karpienko K., Mazikowski A., Jędrzejewska-Szczerska M./ Fiber optic sensor for simultaneous measurement of thickness and refractive index of liquid layers / Metrology and Measurement Systems	100	2019
5.	Marzejon M., Kosowska M., Majchrowicz D., Bułło-Piontecka B., Wąsowicz M., Jędrzejewska-Szczerska M., / Label-free optical detection of cyclosporine in biological fluids / Journal of Biophotnics	100	2019

Most recent externally funded projects you were involved in – no more than 3

No	Project title, the name of the Principal Investigator (PI) and the institution the project was carried out	Years	Role in the project [iv]
1.	Fiber-optic biosensors with metal-oxide ALD coatings, M.Szczerska, M.Szczerska, THE POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE (NAWA)	2020-2021	PI
2.	The application of the photonic structure in optical phantoms mimicking biological tissue, M.Szczerska, THE POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE (NAWA)	2019	PI
3.	System kontroli stresu u dzieci z zaburzeniami rozwojowymi (Automatic recognition of therapy progress among children with autism) M. Szczerska, The National Center for Research and Development (NCBiR)	2018-2019	PI

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Additional relevant information – (no more than 1600 characters)[v]

My first Ph.D. student, dr Daria Majchrowicz, received her Ph.D. degree with honors in Electronics from the Gdańsk University of Technology in 2018.
She became the PI of her Preludium project financed by the Polish National Science Centre.
In 2019 she received the Iwanowska scholarship (NAWA) and joined the the Optical Manipulation Group of Prof. Kishan Dholakia in St.Andrews (UK) as a one-year visiting scholar from September 2019.

I were a co-promotor of two Ph.D. students. Both of them received their Ph.D. degrees with honors.

[i] You may select up to two disciplines out of 12 disciplines represented in the Doctoral School
[ii] Observe the limit of not more than 2000 characters
[iii] Leave only one answer
[iv] Select the role in the project: PI stands for principal investigator (refers to the holder of an independent grant and the lead researcher for the grant project), Co-I for co-investigator (Co-I assists the principal investigator in the management and leadership of the research project), R for researcher
[v] Add any other relevant information e.g. awards for PhD students whom you supervised (no more than 1600 characters)