

Opis delovnega mesta mladega raziskovalca/ke (*Description of the Young Researcher's position*)

1. Članica UL (*UL member*):

Univerza v Ljubljani, Fakulteta za elektrotehniko
(*University of Ljubljana, Faculty of Electrical Engineering*)

2. Ime, priimek in elektronski naslov mentorja/ice (*Mentor's name, surname and email*):

Benjamin Lipovšek (benjamin.lipovsek@fe.uni-lj.si)

3. Raziskovalno področje (*Research field*):

2.09.04 Optoelektronika (*Optoelectronics*)

4. Opis delovnega mesta mladega raziskovalca/ke (*Description of the Young Researcher's position*):

Vključuje morebitne dodatne pogoje, ki jih mora izpolnjevati kandidat/ka za mladega raziskovalca/ko, ki niso navedeni v razpisu za mlade raziskovalce.

slo:

Raziskovalno delo mladega raziskovalca bo umeščeno v širše področje optoelektronike oziroma fotovoltaike, ki tako v Evropi kot tudi v Sloveniji v preteklih letih beleži strm razvoj. Osredotočeno bo na karakterizacijo, analizo in optimizacijo fotonapetostnih modulov in sistemov.

Potek raziskovalnega dela se bo izvajal v več medsebojno povezanih fazah. Prva faza bo usmerjena v razvoj in aplikacijo naprednih merilnih metod za dolgoročno spremljanje delovanja visokoučinkovitih sončnih celic, fotonapetostnih modulov, vse do obsežnih fotonapetostnih sistemov, s poudarkom na večnivojski karakterizaciji (sočasno merjenje tako na nivoju celotnega sistema kot tudi na nivoju posameznega modula, niza, oziroma celice). V drugi fazi bodo dolgoročno karkterizirani različni fotonapetostni gradniki, osnovani na različnih tehnologijah in podvrženi različnim pogojem delovanja. Tretja faza pa bo osredotočena na poglobljeni analizi pridobljenih podatkov, za kar bodo uporabljene napredne simulacijske tehnike in tehnike strojnega učenja oziroma umetne inteligence. Rezultati raziskav bodo služili za optimizacijo obstoječih ter razvoj novih konceptov fotonapetostnih gradnikov, kar bo vodilo v povečanje energijskega izplena tekom celotne življenske dobe.

Mladi raziskovalec bo svoje delo opravljal v okviru Laboratorija za fotovoltaiko in optoelektroniko (LPVO) na Fakulteti za elektrotehniko Univerze v Ljubljani (UL FE). Njegovo raziskovalno delo bo tesno vpeto tako v raziskovalni program »Fotovoltaika in elektronika« (P2-0415) kot tudi v ostale tekoče mednarodne raziskovalne projekte, v sklopu katerih bo sodeloval z drugimi priznanimi raziskovalnimi organizacijami doma in v tujini.

Mladi raziskovalec bo vpisal doktorski študij Elektrotehnika na UL FE. Od kandidata se pričakuje visoka stopnja motiviranosti za delo, suverenost v programiranju in numeričnem modeliranju, da ima izkušnje z eksperimentalnim delom v elektroniki oz. optoelektroniki ter da

obvlada angleški jezik.

eng:

The research activities of the young researcher will be focused on the area of optoelectronics and photovoltaics, which has grown rapidly in the recent years both in Europe as well as in Slovenia. The specific tasks will involve characterization, analysis and optimization of photovoltaic modules and systems.

The research will be conducted in multiple interconnected phases. The first phase will encompass development and application of advanced measurement methods for long-term monitoring of high-efficiency solar cells, photovoltaic modules, and large photovoltaic systems, with focus on multi-level characterization (simultaneous monitoring on the system level as well as on the module, string, and cell level). The second phase will see long-term characterization of different photovoltaic devices, based on different technologies and subjected to different operation conditions. The third phase will be focused on involved analysis of the gathered monitoring data, harnessing advanced simulation methods and machine-learning and artificial-intelligence techniques. Results of the research will enable optimization of the existing and development of novel photovoltaic devices and systems, which will lead to an increased energy yield throughout the lifetime.

The young researcher will carry out his research in the Laboratory of Photovoltaics and Optoelectronics (LPVO) at the Faculty of Electrical Engineering, University of Ljubljana (UL FE). His research activities will be tightly connected to the research programme »Photovoltaics and Electronics« (P2-0415) and other on-going international research projects, which will lead to cooperation with other renowned domestic and foreign research institutions.

The candidate will enroll to the doctoral programme Electrical Engineering at UL FE. He is expected to exhibit a high level of motivation, be well versed in computer programming and numerical modelling, has experience in experimental work in electronics and optoelectronics, and is an advanced user of the English language.