POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE

STER PROGRAMME

name of the unit:

# DIVISION OF CLOTHING & TEXTRONICS

Institute of Textile Architecture, Lodz University of Technology

symbol:

I-41

http://www.iat.p.lodz.pl

| head of the unit: | potential promoters: | contact person: |
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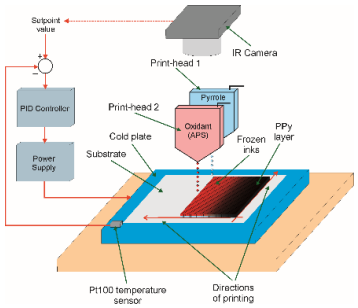
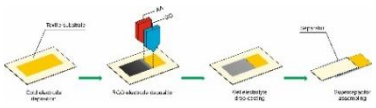
scope of activities:

- Research and development of textronic elements and systems for use in measuring of physiological parameters of the human body,
- research and development of textronic heating elements integrated with clothing,
- research and development of electrically conductive textiles for applications in textronics,
- research and development of printed textronics,
- research and development of textronic power systems,
- research and development of textronic lines for transmitting high frequency signals




present activities:

- We manufacture and test the properties of printed polypyrrole-based supercapacitors using potentiostat and electrochemical impedance spectroscopy technique,
- we produce printed copper layers on textile substrates and test their electroconductive properties,
- we produce sewn-on electrically conductive lines for the transmission of high-frequency signals and we test their transmission properties,
- we analyze the isotropy of conductivity of flat textile electrically conductive materials.

Future activities:

Research and development of 3D printed supercapacitors

Publications/patents, awards, projects:


- Stempien, Z., Rybicki, T., Rybicki, E., Kozanecki, M. & Szynkowska, M. I. In-situ deposition of polyaniline and polypyrrole electroconductive layers on textile surfaces by the reactive ink-jet printing technique. Synth. Met. 202, 49–62 (2015).
- Stempien, Z., Rybicki, E., Rybicki, T. & Lesnikowski, J. Inkjet-printing deposition of silver electro-conductive layers on textile substrates at low sintering temperature by using an aqueous silver ions-containing ink for textronic applications. Sensors Actuators, B Chem. 224, 714–725 (2015).
- Stempien, Z. et al. In-situ deposition of reduced graphene oxide layers on textile surfaces by the reactive inkjet printing technique and their use in supercapacitor applications. Synth. Met. 256, 116144 (2019).
- Tokarska, M. Characterization of electro-conductive textile materials by its biaxial anisotropy coefficient and resistivity. J. Mater. Sci. Mater. Electron. 30, 4093–4103 (2019).



The portfolio of research groups was created as part of the Programme "STER" – Internationalisation of doctoral schools" as part of the realization of the project "Curriculum for advanced doctoral education & taining – CADET Academy of Lodz University of Technology".

- Stempien, Z. et al. Inkjet printing of polypyrrole electroconductive layers based on direct inks freezing and their use in textile solid-state supercapacitors. Materials (Basel). 14, 3577 (2021).

Realized research grants:

- Research project (NCBR) No. PBS3/A9/34/2015 realized in a consortium of 2 scientific partners and 1 SME partner under the PBS3 Applied Research Program, project title: Textronic gas sensors printed on textile substrates, 2015-2018

Keywords:

textronics, printed textronics, textronic transmission lines, electroconductivity of textile materials

List of internship proposal in this research team:

Investigation of the properties of textile based supercapacitors using potentiostat and electrochemical impedance spectroscopy technique