





name of the unit: symbol:		
DEPARTMENT OF MICROELECTRONICS		К-22
		https://www.dmcs.p.lodz.pl/
Lodz University of Technology		
head of the unit:	potential promoters:	contact person:
Wojciech Tylman		
Ph.D., D.Sc.,	Wojciech Tylman	Wojciech Tylman
Assoc. Prof. Lodz	Ph.D., D.Sc., Assoc. Prof. Lodz	phone: 42-631-26-28
University of	University of Technology	wojciech.tylman@p.lodz.pl
Technology		
scope of activities:		graphic material
Within the scope of activities there are subjects connected with data processing and		$\cap$ $\cap$
data analysing using statistical, optimisation and artificial intelligence methods in		52 52
various areas such as:		
human body functioning: medical diagnostics, intelligent clothing control;		
IT networks security: Internet, industrial networks;		
• state of infrastructure: energy networks, particle accelerators.		
The research carried out in recent years was supported by funds from the National		
• Sudden Cardiac Death risk stratification based on functional assessment of		
• "Sudden Cardiac Death fisk straincation based on functional assessment of autonomic nervous system with the use of Holter methods".		
<ul> <li>"Automated multiparameter system for assessment of the patient's general</li> </ul>		SIC OD
condition with comprehensive analysis of the respiratory and circulatory		
functions".		~ (
The team also conducted projects in collaboration with industries.		
present activities:		
The team is currently involved in three projects:		
• "Innovative system for evaluation and rehabilitation of human imbalance" -		
building classifiers allowing fall risk assessment and diagnosis for balance system		
disorders.		
• "Personalized protective thermally active clothing" – development of algorithms		
to maintain thermal comfort of the user based on data from sensors placed in the		
rescue suit.		
FUSKEM - from sky across g	round up to underground – development of a	
	the angular velocity of an optical gyroscope.	
Future activities:		
Future activities are related to the completion of projects which have already started and research within the ITER project (tokamak state assessment using image analysis methods)		
(tokamak state assessment using image analysis methods).		





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Publications/patents, awards, projects:

- Tylman, W., Kotas, R., Kamiński, M., Woźniak, S., Dąbrowska, A. A Thermal Model for Processing Data from Undergarment Sensors in Automatic Control of Actively Heated Clothing. Energies 2022, 15, 169.
- Tylman, W., Kotas, R., Kamiński, M., Marciniak, P., Woźniak, S., Napieralski, J., Sakowicz, B., Janc, M., Józefowicz-Korczyńska, M.; Zamysłowska-Szmytke, E. Fully Automatic Fall Risk Assessment Based on a Fast Mobility Test. Sensors 2021, 21, 1338.
- Kotas R., Janc M., Kamiński M., Marciniak P., Zamysłowska-Szmytke E., Tylman W., "Evaluation of Agreement Between Static Posturography Methods Employing Tensometers and Inertial Sensors," in IEEE Access, vol. 7, pp. 164120-164126, 2019.
- Tylman W., Waszyrowski T., Napieralski A., Kamiński M., Trafidło T., Kulesza Z., Kotas R., Marciniak P., Tomala R., Wenerski M.: Real-time prediction of acute cardiovascular events using hardware-implemented Bayesian networks. ", Computers in biology and medicine 69, 245-253, 2016
- W. Tylman, M. Wenerski, G. Anders "Leak Detection in Slow Oscillation High Pressure Fluid Filled Circuits", IEEE Trans. Power Deliv. 2014, Vol. 29 Issue 2, ss. 769-776, IF=1.519

## Keywords:

Artificial intelligence, neural networks, Bayesian networks, classifiers, biomedical signal processing, numerical methods, optimization methods.

List of internship proposal in this research team:

PhD topics related to data analysis in the areas mentioned.