



POLISH NATIONAL AGENCY
FOR ACADEMIC EXCHANGE



STER
PROGRAMME

<p>name of the unit:</p> <p style="text-align: center;">DIVISION OF NONLINEAR CIRCUITS AND SYSTEMS</p> <p style="text-align: center;">Institute of Electrical Engineering Systems, Lodz University of Technology</p>		<p>symbol:</p> <p style="text-align: center;">I-26</p> <p style="text-align: center;">http://www.weeia.p.lodz.pl/the-faculty/departments/i-26-institute-of-electrical-engineering-systems/</p>
<p>head of the unit:</p> <p style="text-align: center;">Stanisław Hałgas, PhD, DSc, TUL Prof.</p>	<p>potential promoters:</p> <p style="text-align: center;">Stanisław Hałgas, PhD, DSc, TUL Prof.</p>	<p>contact person:</p> <p style="text-align: center;">Stanisław Hałgas, PhD, DSc, TUL Prof. phone: 48 42-631-25-22 stanislaw.halgas@p.lodz.pl</p>
<p>scope of activities:</p> <p>The main research activities include:</p> <ul style="list-style-type: none"> • methods for parametric and catastrophic fault diagnosis in analogue electronic circuits • methods supporting design for testing of analogue systems: selection of test signals, selection of measurement nodes • methods for analysing non-linear electronic circuits • analysis, design and optimisation of energy management systems for hybrid and electric vehicles. 		
<p>present activities:</p> <p>Current research is focused on two issues: methods of testing different classes of analogue electronic circuits and design and optimisation of energy management systems in hybrid vehicles. The main research stream concerns the problem of identification of parameters of electronic circuits on the basis of measurements of circuit quantities so that, taking into account the real conditions resulting from limited access to internal nodes of the circuit and tolerances of components, it is possible to detect and identify parametric and catastrophic faults. The second research area concerns energy management systems for hybrid vehicles using an additional electrical energy storage system in the form of supercapacitors and the optimisation of the parameters of these systems with respect to fuel consumption, emissions and battery life extension.</p>		
<p>Future activities:</p> <p>The work will be directed towards the continuation of current research in methods of analysis and design of analogue circuits and electromobility.</p>		
<p>Publications/patents, awards, projects:</p> <ul style="list-style-type: none"> • M. Tadeusiewicz, S. Hałgas, 'A method for local parametric fault diagnosis of a broad class of analog integrated circuits', IEEE Transactions on Instrumentation and Measurement, 67, 2, 328-337, 2018. • M. Tadeusiewicz, S. Hałgas, 'A method for multiple soft fault diagnosis of linear analog circuits', Measurement, 131, 714-722, 2019. 		



POLISH NATIONAL AGENCY
FOR ACADEMIC EXCHANGE



- M. Tadeusiewicz, S. Hałas, " Soft fault diagnosis of non-linear circuits having multiple DC solutions", IET Circuits, Devices & Systems, 14. 8, 1220-1227, 2020.
- The M.N.S. Swamy Best Paper Award, and The Armen H. Zemanian Best Paper Award for the year 2015 to M. Tadeusiewicz, A.Kuczyński, S. Hałas for their paper 'Catastrophic fault diagnosis of a certain class of nonlinear analog circuits'.

Keywords:

analog circuits, electronic circuits, computer aided design, fault diagnosis, nonlinear circuits, hybrid energy storage system, hybrid electric vehicles, electric vehicles, electromobility.

List of internship proposal in this research team:

Cooperation in research on development of methods supporting design of analogue circuits, implementation of the developed methods and verification of their efficiency, research in the field of electromobility.