


PhD position 11: Intelligent inline failure analysis based on thermal imaging and AI		
Employers		
<p>Prof. Bernhard Wunderle from Technische Universität Chemnitz (TU Chemnitz) in Chemnitz, Germany and Dr. Mohamad Abo Ras from Berliner Nanotest und Design GmbH (Nanotest) in Berlin, Germany are looking for a PhD candidate to join a three-year research training within the EU-funded MSCA industrial doctorate MIRELAI. You will be enrolled in the PhD programme of Technische Universität Chemnitz (TU Chemnitz) and supervised by Prof. Bernhard Wunderle and Dr. Daniel May (TU Chemnitz).</p>		
Project description		
<p>Thermal imaging is a topical method to detect buried flaws (as e.g. material inhomogeneities, cracks, delamination and artefacts or geometric tolerances) in electronic packages which are caused by processing or during operation and thus represent quality and reliability concerns and have to be detected inline by non-destructive techniques. To allow the classification of these defects, AI-based methods are to be employed after post-processing of the thermographs for contrast enhancement. One of the partners (Nanotest) addresses as an SME the Inline Inspection Equipment market for micro,- opto,- and power-electronic module production and has been successfully receiving scientific support from TU Chemnitz in longstanding cooperation with many contacts to industry, the local ecosystem of SMEs and academia as well as the international scientific community. So, the task is to develop a methodology consisting of numerical and experimental techniques for defect detection using thermographic image processing and above all AI-based methods (Neural Networks). In more detail, this involves (1) IR or thermo-reflectance based detection methods enhanced by adaptable hardware (high sensitivity sensor, different high energetic excitation sources for example laser, current, flashlight, or eddy current) (2) Physical understanding generated by multi-field modelling of various defects using finite element modelling to interpret the results obtained from thermography. (3) Extraction and identification of each defect unique thermal signature over time using both, physics as well as AI-based methods. (4) Validation on defects of various kind on benchmark samples under real world conditions.</p>		
International mobility		
<p>As a PhD candidate, you will be employed for 18 months each by TU Chemnitz and Nanotest. During the placement at TU Chemnitz you will undertake a 1-month placement at University of Greenwich (UOG), UK supervised by Dr. Stoyan Stoyanov and during the stay at Nanotest a 1-month placement at Robert Bosch GmbH, Germany supervised by Dr. Charlotte Fischer.</p>		
Requirements		
<p><u>Specific Eligibility Criteria</u> on the Horizon Europe: Marie Skłodowska-Curie (MSCA) programme apply, including the mobility rule and PhD rules. Applicants of any nationality are welcome.</p>		
Additional requirements		
<ul style="list-style-type: none"> · Master's degree in Physics, Electrical Engineering or Material Science · Background in AI-Methods, Finite Element Simulation, Materials, Failure Analysis, Packaging desirable · English proficiency: fluent 		
The monthly support and benefits		
<ul style="list-style-type: none"> · The successful candidate will benefit from an excellent technical and scientific environment, well-equipped and staffed. Both academic, as well as SME/industrial partner, work in international and interdisciplinary teams eager to share their experience and welcome a new member to our friendly and communicative team. We offer international and scientific flair, the best of both worlds in science and technology, true integration into the team, working on an applied subject and getting to know SME/industrial boundary conditions. Possibility of attending conferences on the topic to meet the scientific community. · Personalised career development plans will be established to support the needs of the PhD candidate · The Phd candidate will receive an attractive salary in accordance with the MSCA regulations. The financial package will include: 1) Living allowance of €3,400 (<u>country correction coefficient applies</u>), 2) Mobility allowance of €600, 3) Family allowance (€660), if applicable. The exact (net) salary will be confirmed upon appointment and is dependent on local tax, social and health insurance regulations and the country correction factor 		
Application		
Required documents:	<p>Complete applications in English should include:</p> <ul style="list-style-type: none"> · CV, incl. Letter of motivation, and incl. Letter(s) of recommendation · English language proficiency certificate(s) (not for native speakers) · Transcripts of Student Records 	

Selection process:	<ul style="list-style-type: none"> · Our selection procedure for PhD position is open, transparent, merit-based and in line with the principles set out in the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers · The application dossier needs to be submitted as a single PDF file to Nanotest by 01-12-2022. Please indicate in the subject line: 'MIRELAI: PhD position 11 - your name' · Pre-selected candidates will be invited for interviews by 31-12-2022. Unsuccessful applicants will not receive any notification
Application deadline:	01-12-2022
Expected start date:	The PhD project is set to start between 01-01-2023 and 01-04-2023
Contact person for enquiries:	Dr. Mohamad Abo Ras Email address: aboras@nanotest.eu Phone: +49 30 6392 3880