SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

UNIDEMI – Research Unit in Mechanical and Industrial Engineering

Research interests

Research Team: MTA

R&D Unit in Mechanical and Industrial Engineering

Telmo G. Santos

Mechanical Engineering
(BSc, MSc and PhD)

- Assistant Professor at DEMI;
- Research at UNIDEMI;
- Member of the Portuguese Forum of NDT;

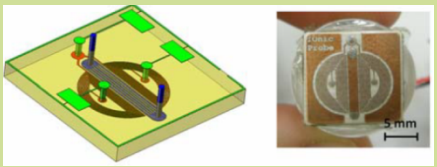
* Projects coordination: 3 (201 k€)
* Patents: 4
* Prototypes: 8
* ISI papers: 16

Main research interests

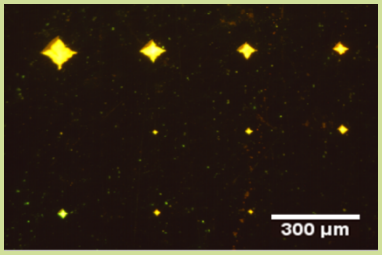
Non Destructive Testing (NDT):
Design and production of dedicated Eddy Current probes;
Development of NDT systems (probes, mechanical devices and software);
Micro defects detection in microfabrication with bacterial cells.

Innovation in manufacturing processes:
Friction Stir Welding (FSW);
Friction Stir Processing (FSP).

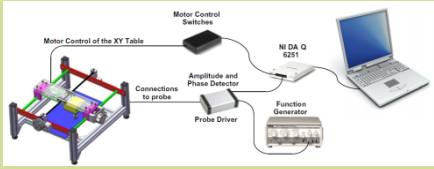
Characterization of processed materials by electric conductivity



Original NDT Eddy Current probe



Detection of micro-defects with bacterial cells



Integrated NDT systems

Methodology

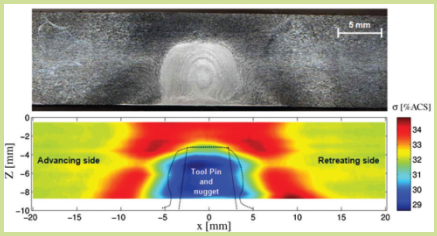
- Experimentation:
  Instrumentation and data acquisition in NDT and manufacturing processes;
  Development of automated mechanized scanning devices;

- Numerical simulation;

- Analytical models;

- CAD 3D, and prototyping;

- Materials characterization:
  Metallography, hardness, electric and magnetic properties…

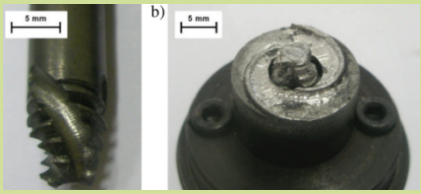


Characterization of processed materials by electric conductivity

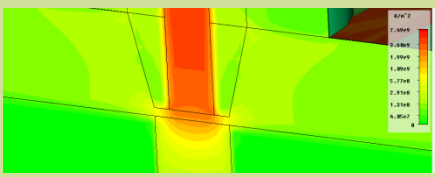
Expected Results

Technical and Scientific:
Establishing innovative NDT techniques and manufacturing processes;
Increase NDT reliability in micro defects detection.

Social:
Improving quality of life by enhancing safety, cost-effectiveness and functionality of products.



Design and production of FSW tools



Numerical simulation of manufacturing processes

Funding:
- AIRBUS Operations GmbH, *Dedicated NDT system to detect LOP root defects in FSW of AlMgSc* (FSWELL);
- FCT-MCE, *Defects Detection in Microfabrication With Bacterial Cells* (MicroBac) - PTDC/EME-TME/118678/2010;
- QREN, *Desenvolvimento de equipamento e sondas de CI para a indústria aeronáutica* (AEROINSPEC).