



# UT Austin Portugal | 2019 Strategic Research Projects

NANOTECHNOLOGIES

## Soft4Sense

Smart Surfaces for Reliable Tooling Integration

The measuring devices available in the market for manufacturing processes fail many times to accurately evaluate important process parameters due to positioning problems or deficient signal acquisition and transfer. The Soft4Sense project will create a new set of software to make it easier to layer thin films on top of equipment by providing the required data to avoid mechanical problems during installation.

Keywords: Thin films, multilayer deposition, nanotechnology



Start Date: 01-APR-2020

Duration: 36 months

Operation Code:45921

### Main challenge/problem the project seeks to address

There is a bottleneck which has impeded the commercial application of thin film devices, not just in Portugal but worldwide: their mechanical integrity. The construction of these films is based on a stacking of layers, each one with a specific role, requiring a suitable matching between them. The mechanical/electrical integrity of thin film devices has to be improved and optimized to allow their reliable and reproducible production in order to be offered to the industrial market.

### Proposed solution

Soft4Sense intends to create a software that will guide the deposition of layer thin films on top of equipment to avoid mechanical/electrical integrity problems during installation. The software will allow the extraction of reliable data on manufacturing processes. This simple program, with the information about the required characteristics of the stacking layers (e.g. residual stress level, defects density, electrical characteristics, hardness, Young's modulus), supplies the deposition conditions for stack fabrication.

### Innovative Potential

Existing measure devices for manufacturing processes do not allow an accurate evaluation of important process parameters as a result of issues with sensors placement and their signal acquisition. Thin film technology loaded with sensors applied directly to the equipment looks promising but installation can be rather tricky. Soft4Sense's innovation potential lies on its software capable of providing the information needed to deposit the thin film device while mitigating the mechanical/electrical integrity problems. This will improve efficiency by reducing redundancies, time, effort and resources.

### Target beneficiaries

Manufacturing Industry

### Consortium

#### PORTUGAL

TEandM – Tecnologia, Engenharia e Materiais S.A (Lead Beneficiary)  
Instituto Pedro Nunes – Associação para a Inovação e Desenvolvimento em Ciência e Tecnologia  
International Iberian Nanotechnology Laboratory (INL)

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