



PERSONA CIENCIA EMPRESA
UNIVERSITAT RAMON LLULL

Fabrication of Electronic Skin Prototype through Plasma Polymerization-Assisted Deposition of pp-PFM/ Gold Thin Films

1 Master research project (6-9 month)

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Summary:

The field of electronic skin, or e-skin, has garnered significant attention for its potential applications in wearable electronics, robotics, and human-machine interfaces. To mimic the functionality of human skin, the fabrication of e-skin prototypes that possess flexibility, sensitivity, and robustness is essential. This proposal aims to develop a prototype electronic skin by immobilizing thin films of gold on an elastomeric substrate through an acrylate linker deposited through plasma polymerization. The elastomeric substrate will provide the required flexibility and stretchability, while the plasma polymerized acrylate thin film will serve as a reliable interface between the gold thin films and the elastomeric substrate. The proposed research plan encompasses several key components. First, the selection and optimization of the elastomeric substrate will be carried out to ensure its mechanical properties are compatible with the e-skin prototype. Subsequently, the plasma polymerization process will be employed to deposit an acrylate thin film on the elastomeric substrate, providing a chemically compatible and mechanically robust interface. The deposition of gold will be optimized and characterized through IR / IR – Raman and other tools of surface engineering. Additionally, efforts will be made to enhance the durability and stability of the e-skin prototype by exploring protective coatings or encapsulation strategies to shield the gold thin films and the acrylate layer from environmental degradation. Depending on the results, the performance evaluation of the e-skin prototype will involve testing its response to mechanical stimuli such as pressure, temperature variations, and strain. This evaluation will determine the sensitivity, reliability, and accuracy of the prototype in detecting and transmitting sensory information.