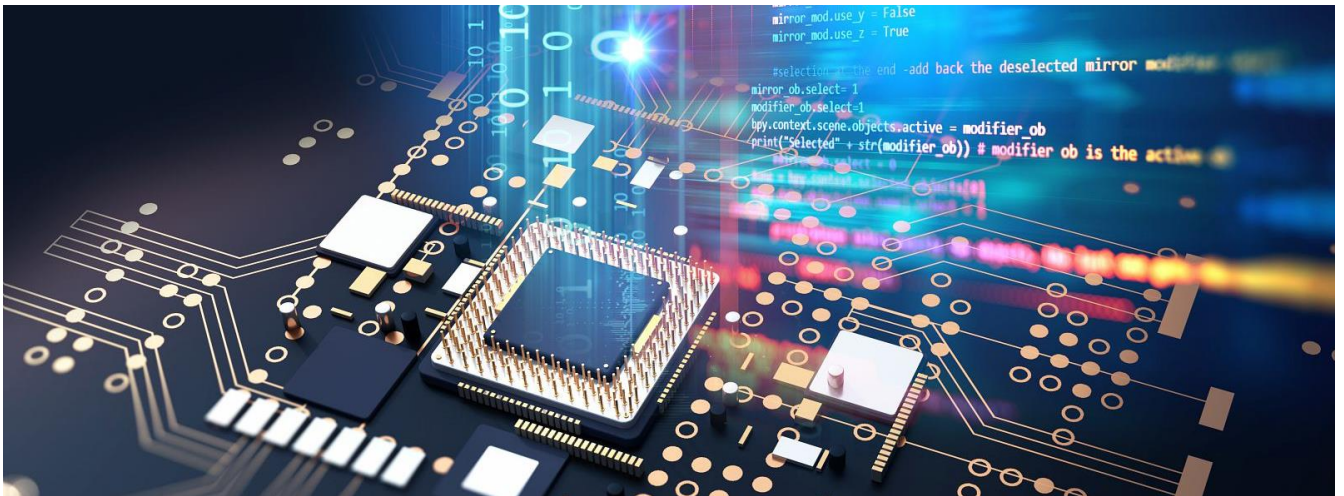


PHD OFFER

P R O C E S S M O D E L I N G

REF: SL-DRT-22-0595

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APPLICATIONS & SOCIETAL IMPACT

ADVANCED MICROELECTRONICS

3D SHAPE FABRICATION

IMAGING SENSORS

**NEURAL NETWORK
PHYSICAL OPTICS
LITHOGRAPHY MODELING
INVERSE PROBLEM**

Requirements: Engineer/M2
Contract Period: 3 years
Start date: 10/2022
Workplace: CEA-LETI

3D micro-fabrication process neural network modeling for optical application

CONTEXT

The realization of 3D micro-structures is needed to build key functional microelectronics elements such as micro-lenses for optical imagers. These lenses can be done in particular by resist reflow or grey levels (grayscale) lithography. Grayscale lithography has the advantage of building structures of different topographies within one single process step. Its success will depend on the process modeling accuracy and on the lithography mask optimization strategy.

ABSTRACT

Grayscale lithography was developed and pushed these past three years at LETI by a CIFRE PhD thesis in collaboration with STMicroelectronics. The objective is to pursue 3D fabrication opportunities opened towards optical applications (imagers, diffractive) but also augmented reality. The thesis work will focus on different methodologies of design and data preparation for the optical mask realization. Especially, in order to maximize the lithography fidelity, non regular pixeling on mask or neural-network based inverse problems will be investigated. The resist process modeling during the 300 mm grayscale lithography will be also crucial and essential for the thesis.

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