



# Christos Theoharatos

## Chief Science Officer

IRIDA LABS S.A.

<http://www.iridalabs.gr>

## Bilateral Meetings

- Tuesday 16:00 - 18:00

### Description

Irida Labs is a leading technology provider of software IPs for Embedded Machine Vision using Visual Perception and Machine Learning. The company possesses significant knowledge in analysis, modelling, design and development of high-fidelity reference systems, using state-of-the-art CPU, GPU, FPGA and DSP technologies in the context of heterogeneous computing. Founded in late 2007, Irida Labs is a privately-held company with headquarters in Patras, Greece and worldwide sales support, backed by VC and private investor. Our engineering team is comprised of highly-skilled personnel with MSc/PhD in Machine Vision, guaranteeing the utmost algorithmic effectiveness and efficiency using state-of-the-art methods. Our product and technology portfolio includes embedded vision software for high throughput applications such as object and pattern detection and recognition using Machine/Deep Learning, as well as 3D imaging and reconstruction, addressing various markets ranging from consumer electronics to industrial vision. Irida Labs has formed collaborations and partnerships with world leaders like Qualcomm, Synopsys, Cadence and Xilinx, and has clients in the USA, China and Europe.

### Organization Type

Company

Request

## Participation to H2020 projects

We are interested in participating to highly-motivated EU funded projects in the field of AM, offering machine vision/learning and deep learning s/w solutions.

### Cooperation Offered

1. R&D Co-operation
2. Technical co-operation

### Cooperation Requested

1. R&D Co-operation
2. Technical co-operation

Request

## **Business contacts in AM market**

We are interested in generating business contacts actively involved in the AM market, companies interested to include vision-based monitoring systems in their processes:

- (a) for generating a highly accurate the 3D model of a manufactured part during the AM process, which can then be compared with the nominal CAD file to detect defects and correct them during the operation
- (ii) for monitoring the melt pool distribution and characteristics in real-time during laser deposition.

### **Cooperation Offered**

1. Technical co-operation
2. R&D Co-operation

### **Cooperation Requested**

1. Technical co-operation
2. License agreement
3. Manufacturing agreement
4. R&D Co-operation

Offer

## **Machine vision solutions in AM market**

IRIDA Labs had developed a novel, vision-based, solution for closing the loop in the AM market. The vision sensing system interacts with the machine process algorithms in order to detect and correct deposition errors, compromising the shape of the manufactured part or the material properties and contributing towards zero-defect AM. To accomplish that, the vision system is comprised of several optical sensors, monitoring three different aspects of the AM process/product, namely the 3D geometry, the temperature profile of the part under production, as well as the melt pool of the laser deposition process.

To accurately create a 3D model of the object under production, optical sensors combined with a DLP projector are used in order to enhance the accuracy of the produced 3D model and assist in the proliferation of the reflecting regions of the parts. Sensorial data are processed by a software tool that constructs a point cloud, which is then compared to the nominal CAD files of the parts to define geometrical differences that are made during the AM process. The interoperable vision system is able to provide a 3D reconstruction of the manufactured part in a highly accurate cloud of points for closed-loop monitoring of the products' properties, enhanced by an IR camera that performs thermal profiling and characterization. In addition, an interoperable vision system for process control consisting of an optical camera integrated on the scanner head for monitoring size, shape and temperature of the melting pool is included, performing on-camera image processing directly on the camera's FPGA for closed-loop AM melting process monitoring.