| Title:	Internship or master thesis proposal
Document Revision:	1
Publication date:	07/03/2024
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Analyze, compare, and implement object counting methods based on Deep Learning techniques

Euresys is a leading and innovative high-tech company, designer and provider of image and video acquisition components, frame grabbers, FPGA IP cores and image processing software. Euresys is active in the computer vision, machine vision, factory automation, medical imaging, and video surveillance markets.

This internship will take place in the Vision software team under the supervision of an experienced software engineer. Euresys is located at Liège Science Park.

The Vision software team develops a library called Open eVision that contains a series of image processing and computer vision tools, including tools based on Deep Learning. The goal of this internship is to analyze and compare various counting methods based on Deep Learning algorithms and then implement one technique in Open eVision.

An example of counting method is "Learning to count everything", V. Ranjan, U. Sharma, T. Nguyen, M. Hoai (https://arxiv.org/abs/2104.08391)
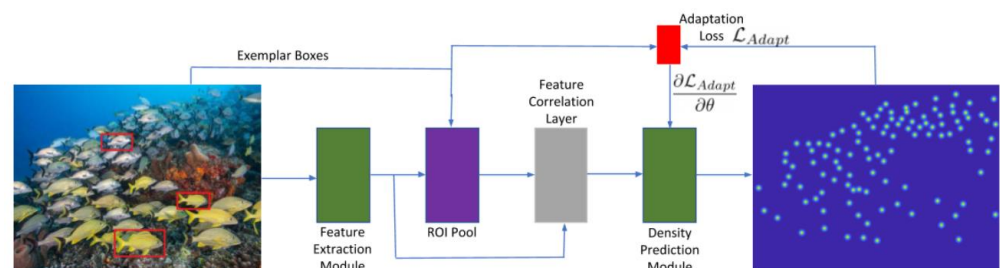
From "Learning to count everything", V. Ranjan, U. Sharma, T. Nguyen, M. Hoai

Objective

For this internship, there are two main objectives:

1. Analyze and compare several counting algorithms based on Deep Learning techniques

    a. Search for paper and their corresponding github implementation

    b. Test on the techniques on public and private datasets of images

    c. Measure their performance in terms of speed and accuracy

2. Implement one technique in C++ with the Open eVision library

    a. Propose an API

    b. Use and extend the Deep Learning framework of Open eVision to implement the technique

Requirements

The intern should have knowledge or experience of C/C++, python, and a Deep Learning framework such as Pytorch.

The internship or master thesis will have a minimum duration of 8 weeks.