

Stage weken voor de opleiding Master Informatica

Titel: Computer Vision: Copy-Paste Data Augmentation

Gegevens bedrijf:

Naam: Vintecc

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Kort (min 120 uur) of lang (min 200 uur): kort / lang

Korte beschrijving van de opdracht:

Training computer vision models starting from real data is a labor-intensive job. The process of gathering labeled images is error-prone and results in slow development. Besides, human labeling is often not perfect and biased by the labeler. Automating the “dataset construction”-phase would seriously decrease the development time for computer vision applications.

At Vintecc two techniques are used to automate the process of dataset construction: synthetic data and data augmentation. Synthetic data is created using a game engine, we can create a world and render images from it. While doing so it is important to include real world features within the synthetically rendered images to close the domain gap. Some real-world scenarios are hard to reproduce synthetically therefore the second option, data augmentation, is a valid alternative. Here we start from existing real data and create variations with it, resulting in representative new data. The copy-paste learning augmentation technique showed promising results within an academic setting.

We already have some synthetic and real-world data, but it would be interesting to see what our deep neural networks would learn from hybrid data, created with copy-paste data augmentation. For some of our projects in the agricultural, food, or mining industry, we could heavily profit from this interesting type of data augmentation.

Goals

The goal of this internship is to create a data augmentation workflow that seamlessly plugs into an existing Python package. This package would enable us to easily create new datasets using real or synthetic backgrounds or objects with their masks. It would also enable us to perform the augmentation on-the-fly, in the training phase of deep learning.

Methodology

In the first part, you would start with the existing literature about this topic. Then, you would quickly transition to the implementation part. We have already started with something, so you could use our work as a starting point for the second part.

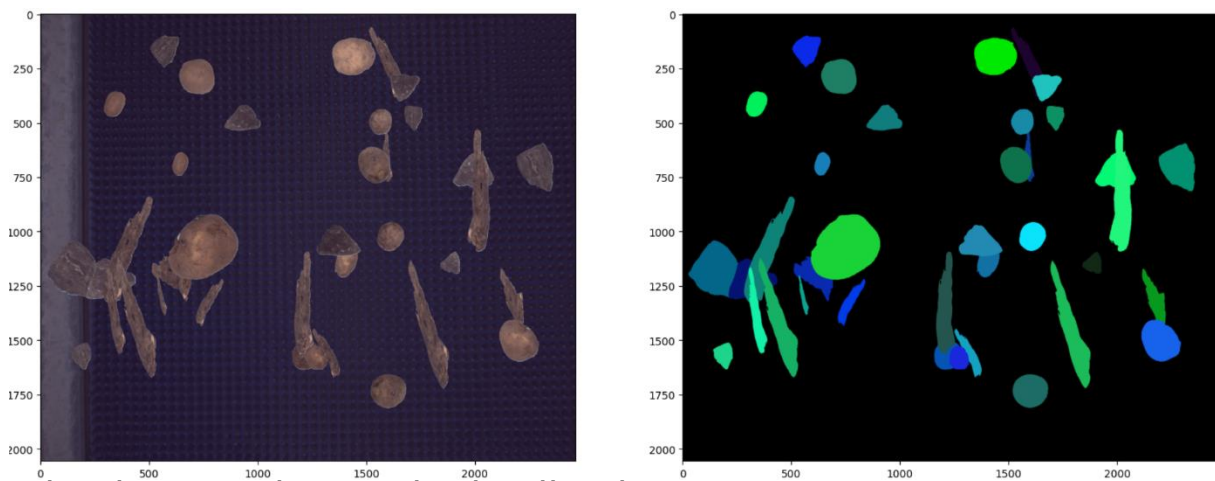
Example real data:



Example synthetic data:



Example hybrid data:



Technologieën die aan bod zullen komen:

Computer vision, deep learning, data augmentation