

Graduation student: Deep learning for recognition of seeds in images

We solve the unsolvable!

Who enables supermarkets to provide its stores in time without wasting fuel?

Who enables advertisers to calculate the optimal price for billions of online advertising opportunities a day?

Who enables manufacturers to deliver milk cartons or Coca-Cola at the right location in time?

Who enables Shell to store enough fuel?

Who enables scouts of soccer talent to select more efficiently and in a reliable way?

Who enables health care organizations to schedule the right nurse at the right time?

ORTEC does!

You encounter us every day. We improve crucial business processes. Things that might seem obvious, are actually very special in their complexity. Not everyone can do what we can. And we don't do it just because we can, but because we are truly dedicated and passionate about it.

Who we are

ORTEC is world leader in optimizing business processes and enriching data, which enables our customers to be more efficient, profitable and competitive. With our mathematical knowledge, clever algorithms, data science models and software engineering skills, we support global companies in making smart strategic, tactical as well as real-time operational decisions.

We are passionate about improving our customers' business and contributing to a better world by always taking sustainability into account and by participating voluntarily in charity projects. We regularly win awards like Top Employer 2014, the Industry Business Success Award 2015 and the Mathematics Olympiad for Businesses 2016.

As a **Graduation student** at ORTEC you will be part of the Center of Excellence within ORTEC Consulting. The Center of Excellence continuously seeks to improve the knowledge base of ORTEC consultants and data scientists thereby improving project quality for our customers. In particular, we are exploring data science and machine learning methods that can be applied to optimize challenges in our customer's businesses. In this project, you will work in close cooperation with the company IMIX (www.imix.nl) who is the owner of the data and specific classification challenge.

The aim of this thesis is to develop efficient methods that classify images of very similar seeds, where each image depicts one seed. From a methodological perspective, the main aim is to explore how deep learning methods (neural nets) can be applied for this task. From an application perspective, the additional challenge is to find out how image information and characteristics of objects can be combined optimally to increase classification performance, when compared to using only image information.

At a more detailed level, classification questions concerns

- At which layer in the network, high level object features from classical image processing or other sensors can be injected to boost performance

- the difference between 1-versus-all classification and identifying several types of seeds
- impact of variation in images, such as color, intensity and scaling
- sensitivity to the learning set (merging images)

In order to test the proposed methods, they need to be coded into a working algorithm. This will preferably be done in a programming language (Python/MxNet) and environment that can be used by our partner IMIX without too many modifications.

Who you are

- A student in the master phase of a data science study or related,
- Able to handle high complexity and work in a team,
- Conscientious in staying abreast of new developments,
- Passionate about Machine Learning, it's no coincidence that this is your study
- Skilled in coding (machine learning) algorithms.

What we offer

- A practical and challenging case on which you can exercise your theoretical knowledge,
- A pleasant, open, informal atmosphere
- Early responsibility
- Inspiring, smart and enthusiastic colleagues
- Ample opportunities to develop yourself (internationally)
- Excellent pay and conditions
- Active employee association

What to expect

We help you to thrive in your field of expertise. We offer development programs, tailored to your individual needs and function requirements, including opportunities to attend courses and seminars. We offer challenging practical hands-on experience with opportunities to work abroad. We operate a flat organizational structure that keeps communication lines short. The atmosphere is open, informal, cooperative and positive. We employ over 800 people in the Netherlands (HQ), Belgium, Germany, France, the U.K., Romania, Italy, the U.S., Australia, Brazil, Poland and Denmark.

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Acquisition as a result of this vacancy is not appreciated.