Transfer learning [XWL18] can be a further extension. Propagation [VC17] can be extended across pairs or groups of images. Cross-category image datasets, ideas like deep metric learning [FWR17] and random-walk label localization and segmentation across nearby frames [TAS17]. On unstructured Recurrent neural networks (RNN) can be applied to video segmentation in particular to [SSS17] or bridge the predicted segmentations with their ground truth [LCC16]. Generative adversarial learning can be employed to either augment the dataset or bridge the predicted segmentations with their ground truth [LCC16]. Several ideas can be investigated in the context of deep learning. For instance, labels as well as a large amount of unlabeled images.

The goal of this PhD is to study semantic segmentation in images or video with minimal supervision. This task will be placed into a setting where only image-level annotation is provided [KL16]. To begin, additional supervision such as clicks [BRF16], strokes [VC17], or bounding boxes [RPK17] may also be assumed. Towards the end of the PhD, the student is expected to work with datasets of mixed levels of supervision, including a harder, semi-supervised setting where there are only a few image-level labels as well as a large amount of unlabeled images.

Several ideas can be investigated in the context of deep learning. For instance, generative adversarial learning can be employed to either augment the dataset [SSS17] or bridge the predicted segmentations with their ground truth [LCC16]. Recurrent neural networks (RNN) can be applied to video segmentation in particular to localize and segment semantic parts across nearby frames [TAS17]. On unstructured image datasets, ideas like deep metric learning [FWR17] and random-walk label propagation [VC17] can be extended across pairs or groups of images. Cross-category transfer learning [XWL18] can be a further extension.
Keywords:

semantic segmentation, minimal supervision, deep architectures, adversarial learning, recurrent networks, metric learning

References:


Main activities

Not applicable.

Skills

The candidate should ideally have a degree in Computer Science, Applied Mathematics or Electrical Engineering; solid mathematical background and programming skills; fluency in English language; preferably, prior experience in computer vision, machine learning or data mining.

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Sports facilities

Remuneration

Gross salary: 2653 euros