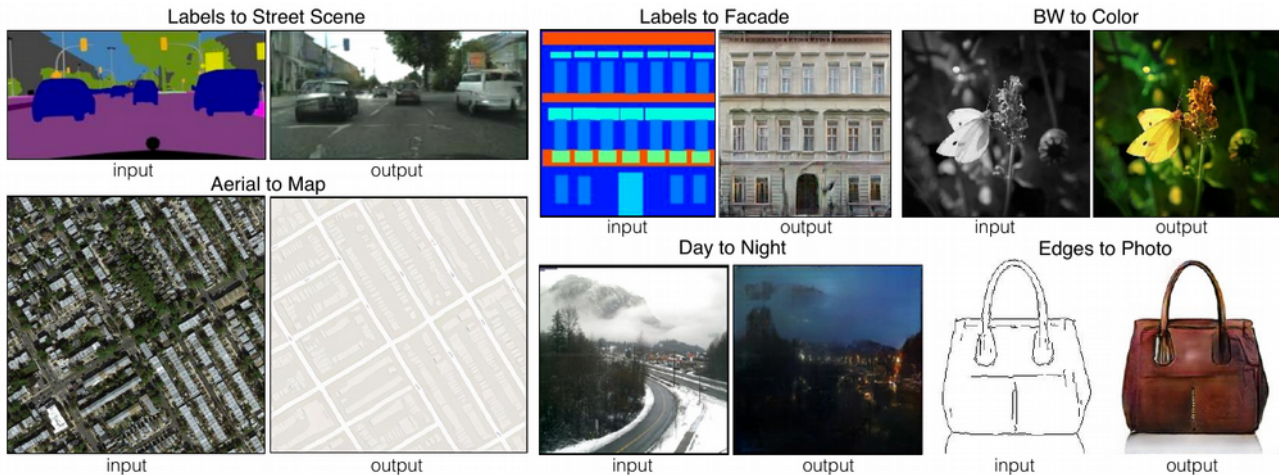


Computer Vision and Remote Sensing - Master Thesis



Generative Adversarial Networks for Remote Sensing image synthesis



Examples for GAN-based image-to-image translation [3]

Generative Adversarial Networks (GANs) are generative models, i.e. methods that estimate the probability distribution of certain data to be able to sample from it and generate realistic samples. Modern GAN-based methods applied to optical close-range images are extremely successful and produce photo-realistic images of e.g. faces (of persons that do not exist). Applications range from using GANs as feature extractors to data augmentation with synthetic data. This work aims to use this approach for remote sensing images, i.e. generating patches of satellite imagery. That can then be used for data augmentation, experiments on synthetic data, or further analysis.

References:

- [1] “Large scale GAN training for high fidelity natural image synthesis”, A. Brock et al.
→ <https://arxiv.org/abs/1809.11096>
- [2] “Stargan: Unified generative adversarial networks for multi-domain image-to-image translation”, Y. Choi et al.
→ <https://arxiv.org/abs/1711.09020>
- [3] “Image-to-image translation with conditional adversarial networks”, P. Isola et al.
→ <https://arxiv.org/abs/1611.07004>
- [4] “Generative Adversarial Networks”, I. Goodfellow et al.
→ <https://arxiv.org/abs/1406.2661>

Recommended:

- Good programming skills (e.g. python, C++)
- Knowledge in Computer Vision and Machine Learning
- Good English skills
- Access to a GPU (for local development; final experiments can be performed on a GPU server)

Contact:

Dr. Ronny Hänsch
ronny.haensch@dlr.de

Please feel free to reach out for more topics e.g. on Machine Learning, Deep Learning, Ensemble Learning, Computer Vision, Remote Sensing, Earth Observation, Synthetic Aperture Radar or to conduct your Master thesis with a paid contract directly at the DLR in Oberpfaffenhofen.