Univ.-Prof.[in] **Dr.**[in]
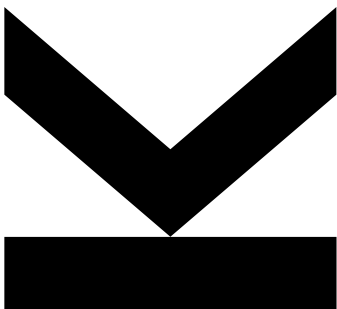**Cristina Olaverri Monreal**
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MASTER THESES

TEMPLATE FOR SCIENTIFIC WORKS

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I. Denoising images.

A. Research Idea

Various innovative and disruptive solutions in the field of intelligent transportation systems (ITS), such as autonomous driving and mobility analytics, involve making predictions based on data. Furthermore, generating such predictions is highly non-trivial given the typical sensitivity of perception sensors to noisy data.

Common approaches use Convolutional Neuronal Networks (CNN) to estimate the distribution of images missing parts. These solutions are promising and tend to outperform conventional methods, however they relied on the availability of paired training dataset where input noisy images and output "clean" images are mapped. This paired dataset are generally unavailable or really hard to derive.

A promising approach to generate a paired dataset is the use of Generative Adversarial Networks to create "real" noise on images that can be used to train an upcoming CNN to denoise input data. Therefore, the goal of this theses is to study the use of GANs to denoise images that are corrupt due to weather conditions (rain, snow, lightning).

B. Research Questions.

- Which noisy conditions can Generative models replicate to generate reliable augmented data?
- How to assess quality of generated data?
- How can the distribution shift between generated data and real data be minimized?
- ormer approaches?