

**DAUGMENTOR: AUTOMATING GENERATIVE
ADVERSARIAL NETWORK TUNING AND
MODULATION FOR DATA AUGMENTATION**

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Abstract

Machine Learning as a subset of Artificial Intelligence or AI enables machines to simulate certain human behaviors without explicit programming. In simple terms machine learning is learning from the given data sample and applying what the algorithms have learned to make informed decisions. Moreover, ML fuels a lot of automation in tasks that span across multiple domains and industries. Over the years researchers and scientists have also used these outperforming techniques to stimulate human brain functionalities which is a collection of millions or neurons. As a result of that, an evaluation of machine learning or deep learning has become the latest research area in the domain of artificial intelligence.

Generative Adversarial Networks or GANs, a type of generative modeling has achieved a tremendous success in the domain of deep learning. Furthermore, Generative Adversarial Networks have the ability to understand and learn the distributions of a given data sample and produce new samples which have similar distribution to the original sample. GAN architecture consist two neural networks called generator and discriminator and those two neural networks work against each other. Even though GANs have outperformed in various deep learning tasks such as data generation, neural style transferring and image super resolution etc. The advanced theories behind GANs and prior knowledge required to train generative adversarial networks and overcome training phase related issues have become few of the main reasons why researchers from other domains have not applied GANs.

If the experts in various other domains who are not familiar with generative adversarial networks, given a system to make use of its capabilities and advantages in their respective researches or projects in a less logical manner, it would boost the technological revolutions in those domains. DAugmentor provides a novel system which assembles the best fitting GAN architecture based on the given dataset. Moreover, DAugmentor provides a novel mechanism to identify model collapse issue in the GANs and also an open source search space which enables experts to contribute their novel findings. Additionally, DAugemntor was able to perform augmentations for CORONA-Hack dataset and it proves the system concept is useful to the majority even during a global pandemic.

Subject Descriptors:

Automation in Data Augmentation

Generative Model Tuning

Key words:

Data Augmentation, Generative Adversarial Networks