**Related Works**

**A survey on text generation using generative adversarial networks**

(<https://www.sciencedirect.com/science/article/abs/pii/S0031320321002855>)

In the production of images and videos, Generative Adversarial Networks (GANs) have demonstrated outstanding performance. However, since text data is discrete in nature as opposed to the continuous data utilized in picture production, creating natural language using GANs is a more difficult challenge. This article explores the many strategies used to address the problems brought on by the discrete nature of text data and gives a thorough assessment of current experiments on text creation using GANs.

The research examines Gumbel-Softmax differentiation, reinforcement learning, and altered training objectives as three potential approaches for GAN-based text production. When using discrete data, the Gumbel-Softmax differentiation approach enables the backpropagation of gradients in GANs. With the use of reinforcement learning, text is generated by rewarding the GAN for constructing well-organized and grammatically sound phrases. GANs are assisted in learning the underlying distribution of the text data through the use of modified training objectives.

The limits of GANs in managing linguistic elements like grammar and syntax are also covered by the authors. The research makes the case that using Transformer-based architectures and pre-learning procedures employing embedding models that have already been trained may help to alleviate some of these drawbacks. Pre-trained embedding models like BERT and GPT-2 can direct GANs to produce more grammatically accurate and comprehensible texts. On the other hand, transformer-based designs have demonstrated exceptional effectiveness in producing natural language and might be used with GANs to enhance their performance.

In conclusion, GAN-based text creation has demonstrated promising results in creating natural language, while being a relatively new area of study. The restrictions brought on by the discrete nature of text data, as well as the requirement to include linguistic elements like grammar and syntax into GAN-based text production, are among the numerous issues that still need to be resolved. However, pre-trained embedding models and Transformer-based architectures may be used to significantly advance GAN-based text production.

**Text-to-Text Generative Adversarial Networks**

(<https://ieeexplore.ieee.org/document/8489624>)

The suggested Text-to-Text Generative Adversarial Networks (TT-GAN) model converts source text into semantic information, which is then used to produce new text, in order to get around the problems with employing GANs for natural language processing. The model was tested on a dataset of movie reviews, and the findings revealed that it was able to produce convincing and realistic text as well as paraphrases and semantic summaries of the original material.

The authors point out that their model is the first to produce genuine language on a semantic level, opening up new research opportunities for GANs in NLP. The TT-GAN model has a wide range of possible applications, including automatic summarization, machine translation, and text synthesis for chatbots. The authors also state that they intend to expand their model's capabilities in order to handle more versatile text formats and look into new applications.