Hochschule der Medien

Fakultät für Druck und Medien

Computer Science and Media

Generative Data Augmentation

**Multi-Agent Diverse Generative Adversarial Networks
for Generative Data Augmentation**

**Dissertation submitted for the degree of
Master of Science**

Topic: Generative Data Aufmentation

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Abstract

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1 Introduction and Motivation

Generative Adverserial Netwrorks (GANs) [GPAM$^+$14] and their variants revolution-ized the field of computer vision in the year of 2014, enabling advacements in multiple areas of generating data. From *Text to Image Synthesis* [RAY$^+$16], *Image Transla-tion* [IZZE18], *Super Resolution* [LTH$^+$17], *Image Inpainting* [PKD$^+$16], *Style Trans-fer* [WWR$^+$23] to *Data Augmentation* [SK19], GANs have been used in a variety of applications.

The idea of using GANs for Generative Data Augmentation (GDA) has already been applied sucessfully, e.g.: in computer vision [JLR25] or for creating music [JLY20]. Especially the former survey *A Comprehensive Survey of Image Generation Models Based on Deep Learning* has, along Variational Auto Encoders (VAEs), a dedicated focus on GANs.

Regardless of the achievements of GANs they suffer from multiple problems:

- Failure to Converge
- Mode Collapse
- Vanishing Gradiants
- Unstable Gradiants
- Imbalance between Generator- and Discriminator Model

This thesis investigates the potential of using GANs - specifically *Multi-Agent Di-verse Generative Adversarial Networks* (MADGANs) [GKN$^+$18] for Generative Data Augmentation.

Aim of the Thesis   The aim of the thesis is to investigate the potential use....

2 Related Work

3 Preliminary Remarks

4 Theoretical Background

5 Theoretical Background

6 Experiments Results

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7 Outlook

8 Conclusion

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Appendix

Declaration of Academic Integrity

Generative Data Augmentation

Multi-Agent Diverse Generative Adversarial Networks for Generative Data Augmentation.

I hereby declare that I have written this thesis independently. I have properly cited all passages that are taken verbatim or in essence from published or unpublished works of others. All sources and aids used in the preparation of this thesis have been fully acknowledged. Furthermore, this thesis has not been submitted, in whole or in substantial part, to any other examination authority for academic credit.

Signiture :   *Place*, *Date* :