Estimation with GANs

Master's Thesis

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Supervisor: Prof. Dr. Joachim Freyberger

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Marvin Benedikt Riemer

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1 Introduction

Welcome to my thesis! It is based on the paper Kaji, Manresa, and Pouliot (2023).

2 Method

Consider the problem of estimating the parameters of a structural economic model. For $k \in \{1, \ldots, K\}$, let

$$Y_k = f_\Theta(X_k, Z_k;), \tag{1}$$

where Y_k is a vector of outcome variables influenced by a vector of noise variables Z_k via a set of (possibly endogeneous) variables X_k. The strength and functional form of the relationships between the variables is defined by a function f and its parameters Θ.

Algorithm 1 Adversarial estimation

```
Initialize
for number of iterations do
    Update the discriminator
    Update the generator
end for
```

The GAN was first proposed by I. J. Goodfellow et al. (2014) (later published as I. Goodfellow et al. (2020)).

3 Simulation

Now I undertake a simulation study in Python, utilizing the library `pytorch` (Ansel et al. (2024)).

4 Conclusion

This section concludes.

Appendix A Acknowledgement of system use

The author gratefully acknowledges the granted access to the Marvin cluster hosted by the University of Bonn.

References

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Selbstständigkeitserklärung

Ich versichere hiermit, dass ich die vorstehende Masterarbeit selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe, dass die vorgelegte Arbeit noch an keiner anderen Hochschule zur Prüfung vorgelegt wurde und dass sie weder ganz noch in Teilen bereits veröffentlicht wurde. Wörtliche Zitate und Stellen, die anderen Werken dem Sinn nach entnommen sind, habe ich in jedem einzelnen Fall kenntlich gemacht.

3. September 2024

Marvin Benedikt Riemer