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Sanaa Kaddoura

A Primer on Generative Adversarial Networks

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Preface

Generative Adversarial Networks, or GANs, are a type of artificial neural network that has taken the field of machine learning to another level. Ian Goodfellow and his colleagues invented it in June 2014. GANs have the unique ability to generate new, realistic data that closely mimics the distribution of the original dataset they were trained on it. GANs can create images, videos, and even music. It revolutionized many domains, such as computer vision, natural language processing, and robotics. GANs can produce photos of human faces that cannot be differentiated from the photo taken by a camera.

This book, *A Primer on Generative Adversarial Networks*, is designed for readers who want to learn GAN without going into their mathematical background. Also, the book considers the straightforward applications of GANs, which allows a beginner reader in this topic to learn it. The book suits researchers, developers, students, and anyone wanting to practice GANs. The author assumes the reader is familiar with machine learning and neural networks. The book will include some ready-to-run scripts that can be used for further research. The programming language used in the book is python. So, it is assumed that the reader is familiar with the basics of this language.

The book starts with an overview of GAN architecture, explaining the idea of generative models. Then it goes into the most straightforward GAN architecture that is utilized to explain how GANs work, including the generator and discriminator concepts. Next, the book delves into more advanced applications of GANs from the real world such as human faces generation, deep fake, CycleGANs, and others.

By the end of this book, the readers will be able to write their own GAN code after understanding how GAN works and its potential applications. The reader can employ GANs as a solution in their projects. Whether the reader is a beginner or a seasoned machine learning practitioner, I hope this book will suit you.

All the codes of the book can be downloaded from: https://github.com/sn-code-inside/A-Primer-on-GNAs

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