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EdgeAI for Algorithmic Government

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Dedicated to

*My **"Gurumaa"** for holding my hand in Life,*
*My **"Parents"** for making me stand in Life,*
*My **"Nephews – Reyaansh & Atharva"** for making me strong in Life,*
*My **"Brother & His Wife"** for helping me progress in Life, and*
*My **"Wife"** for supporting and loving me unconditionally in Life!*

—Dr. Rajan Gupta

*My **"Family"** for always believing in me and supporting me.*

—Sanjana Das

*The memory of my **"Parents"**...*

—Dr. Saibal Kumar Pal

Preface

This book titled *EdgeAI for Algorithmic Government* has got three significant things to offer—Introduction to Algorithmic Government and Large-Scale Decision-Making, various computing technologies around Algorithmic Government like Cloud, Fog, Edge, and EdgeAI, followed by potential use cases of EdgeAI for Algorithmic Government around the world.

Algorithmic Government or Government by Algorithm is an emerging concept introduced around the world in recent years. It involves using Data Science and Artificial Intelligence for decision-making by the Government for various services and processes. Algorithms facilitating large-scale government decision-making processes and public services must be well structured, secure, and fast, resulting in transparent and righteous governance. The cloud-centric architecture of AI is no longer suitable for the rapid calculations and analysis that must be performed on such a massive volume of data. To this end, we need to bring the AI services closer to the user devices, i.e., at the edge of the network. This complimentary relationship of Edge Computing and AI is what we call EdgeAI or Edge Intelligence, which aims to realize the potential benefits of AI at the network edge instead of the network core.

The first chapter covers the background of Algorithmic Government, various concepts, motivations, and benefits, large-scale decision-making for government, and different technological solutions. The second chapter introduces the concept of Edge Computing and various types of

AI techniques used for analysis purposes for computing different tasks. The third chapter focuses on EdgeAI principles, levels of Edge Intelligence, and model training/inferencing at Edge. The fourth chapter presents various Algorithmic Government use cases where EdgeAI would be applicable and beneficial. Chapter five presents a combined framework for EdgeAI applications, network integrations, resource management, coexistence of cloud and edge, reliability of Edge devices, hardware level requirements, and future scope of work.

This book will serve as introductory material for the readers from technology, public policy, and management fields. It will help develop understanding around different concepts present for automated large-scale decision-making and usage of EdgeAI technology in the public sector as an advancement. The reader should differentiate E-Governance as the digitization of the Government processes, and Algorithmic Governance as the automated decision-making on behalf of the Government.

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