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## PREFACE

The last mile of the delivery process is often considered the most crucial and challenging phase in the supply chain. It involves the final leg of transporting goods from a distribution center to their ultimate destination, typically a consumer's doorstep. The efficiency and effectiveness of last mile deliveries have a significant impact on customer satisfaction, operational costs, and overall logistics performance.

The need for speedy and dependable delivery has grown, and as a result, optimizing last mile shipments has emerged as a crucial field for research and technology. Traditional methods of route planning and scheduling may not always be effective in dynamically changing delivery scenarios, leading to inefficiencies and delays. This is where the power of deep learning, a subset of machine learning, comes into play.

In this research report, the fascinating possibilities of last mile delivery optimization using deep learning are explored. The latest advancements in the field, include various deep learning architectures, techniques, and algorithms that can be applied to tackle the challenges of last mile deliveries. The key concepts, methodologies, and applications of deep learning in the context of optimizing last mile deliveries, ranging from route planning and vehicle routing to demand prediction and resource allocation are discussed.

## ABBREVIATION LIST

- ATSP – Asymmetrical Travelling Salesman Problem
- NN - Neural Network
- UTNN – Unregularized Theta Neural Network
- RP – Routing Problem
- PPM - Prediction by Partial Modelling
- RP CLI – Routing Problem Command Line Interface
- SD – Sequence Deviation
- ReLU - Rectified Linear Unit