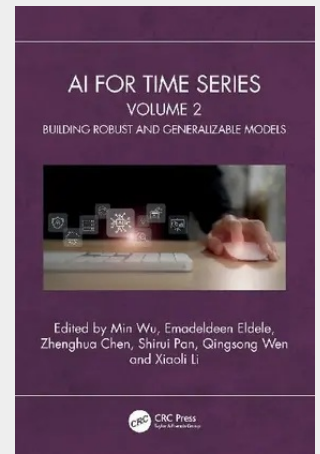


AI for Time Series

Volume 2: Building Robust and Generalizable Models

This book provides a thorough exploration of the latest innovations in AI for general time series analysis, distribution shift and foundation models. It offers an in-depth look at cutting-edge techniques and methodologies, using advance algorithms that are transforming time series analysis across industries. The authors highlight the use AI models, particularly those based on deep learning, to study the sequence of data points collected at successive points in time. In the study of the use of AI for general time series analysis, readers are introduced to a recent important model like TimesNet, which has set new benchmarks for general time series analysis. TimesNet is a cutting-edge model for time series analysis, which transforms one-dimensional time series data into two-dimensional space to better capture temporal variations. This approach allows TimesNet to excel in various tasks such as short- and long-term forecasting, imputation, classification, and anomaly detection. The authors also discuss distribution shift in time series, with an important coverage on the use of AdaTime. This is a benchmarking suite for domain adaptation which addresses distribution shifts in time series data through unsupervised domain adaptation (UDA) In the last section, a significant focus is placed on the emergence of time series foundation models, particularly for forecasting. The book explores pioneering models like MOIRAI and Time-LLM, which are designed to offer universal forecasting capabilities across diverse time series tasks. The book can be used as a supplementary reading for graduate students taking advanced topics/seminars on advanced deep learning and foundation models. It is also a useful reference for researchers and engineers working on time-series applications in finance, healthcare, energy, climate.

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