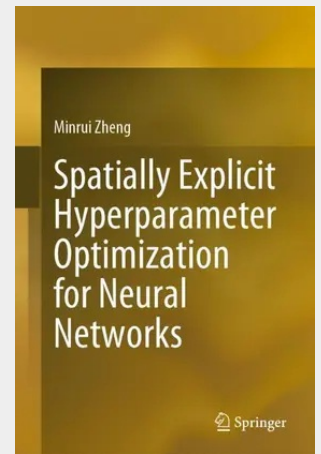


Spatially Explicit Hyperparameter Optimization for Neural Networks

Neural networks as the commonly used machine learning algorithms, such as artificial neural networks (ANNs) and convolutional neural networks (CNNs), have been extensively used in the GIScience domain to explore the nonlinear and complex geographic phenomena. However, there are a few studies that investigate the parameter settings of neural networks in GIScience. Moreover, the model performance of neural networks often depends on the parameter setting for a given dataset. Meanwhile, adjusting the parameter configuration of neural networks will increase the overall running time. Therefore, an automated approach is necessary for addressing these limitations in current studies. This book proposes an automated spatially explicit hyperparameter optimization approach to identify optimal or near-optimal parameter settings for neural networks in the GIScience field. Also, the approach improves the computing performance at both model and computing levels. This book is written for researchers of the GIScience field as well as social science subjects.

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