

Applying Deep Learning in the Life Sciences

Applying Deep Learning in the Life Sciences provides a practical introduction to artificial neural networks and modern deep learning techniques through real-world applications in computational biology, bioinformatics, and biomedicine. Rather than focusing on abstract theory of artificial neural networks, the book emphasizes implementations, demonstrating how these methods can be used to solve contemporary biological problems using accessible explanations and fully reproducible Python and R codes. From biological sequence analysis to biomedical imaging, readers learn by working through realistic examples drawn from the life sciences. Designed for immediate practical use, the book bridges the gap between machine learning theory and biological research. Complex concepts are explained in clear, straightforward language with minimal terminology, making the material accessible to readers from both computational and experimental backgrounds. Every chapter combines intuitive explanations with step-by-step code implementations, enabling readers to develop, train, evaluate, and interpret deep learning models for their own research projects. Key Features: - Covers the complete deep learning workflow, from data preprocessing and model development to evaluation, interpretation, and deployment in life science applications. - Presents hands-on Python implementations of convolutional neural networks (CNNs), long short-term memory (LSTM) networks, Transformers, Autoencoders, and other modern architectures. - Demonstrates deep learning applications across genomics, metagenomics, ancient DNA analysis, biomedical imaging, and natural language processing for biological sequences. - Explains complex concepts using intuitive language, practical examples, and fully reproducible code, allowing readers to immediately apply the methods to their own datasets. - Includes contemporary case studies, best practices, and practical guidance for applying deep learning to real-world biological and biomedical research. Written for students, researchers, bioinformaticians, computational biologists, data scientists, and biomedical researchers, Applying Deep Learning in the Life Sciences serves as both a practical learning resource and a long-term reference for anyone seeking to apply modern artificial intelligence techniques to biological data analysis.

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