

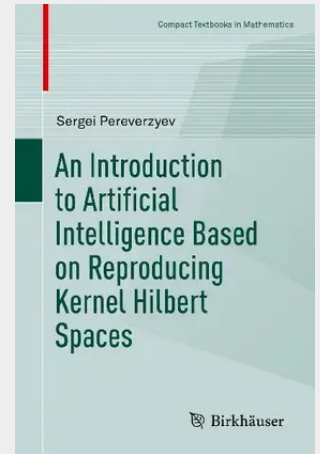
An Introduction to Artificial Intelligence Based on Reproducing Kernel Hilbert Spaces

This textbook provides an in-depth exploration of statistical learning with reproducing kernels, an active area of research that can shed light on trends associated with deep neural networks. The author demonstrates how the concept of reproducing kernel Hilbert Spaces (RKHS), accompanied with tools from regularization theory, can be effectively used in the design and justification of kernel learning algorithms, which can address problems in several areas of artificial intelligence. Also provided is a detailed description of two biomedical applications of the considered algorithms, demonstrating how close the theory is to being practically implemented.

Among the book's several unique features is its analysis of a large class of algorithms of the Learning Theory that essentially comprise every linear regularization scheme, including Tikhonov regularization as a specific case. It also provides a methodology for analyzing not only different supervised learning problems, such as regression or ranking, but also different learning scenarios, such as unsupervised domain adaptation or reinforcement learning. By analyzing these topics using the same theoretical framework, rather than approaching them separately, their presentation is streamlined and made more approachable.

An Introduction to Artificial Intelligence Based on Reproducing Kernel Hilbert Spaces is an ideal resource for graduate and postgraduate courses in computational mathematics and data science.

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