

Data-Driven Science and Engineering

Data-driven discovery is revolutionizing the modeling, prediction, and control of complex systems. This textbook brings together machine learning, engineering mathematics, and mathematical physics to integrate modeling and control of dynamical systems with modern methods in data science. It highlights many of the recent advances in scientific computing that enable data-driven methods to be applied to a diverse range of complex systems such as turbulence, the brain, climate, epidemiology, finance, robotics, and autonomy.

Aimed at advanced undergraduate and beginning graduate students in the engineering and physical sciences, the text presents a range of topics and methods from introductory to state of the art.

Steven L. Brunton is Associate Professor of Mechanical Engineering at the University of Washington. He is also Adjunct Associate Professor of Applied Mathematics and a Data-Science Fellow at the eScience Institute. His research applies data science and machine learning for dynamical systems and control to fluid dynamics, biolocomotion, optics, energy systems, and manufacturing. He is an author of two textbooks, received the Army and Air Force Young Investigator Program awards, and was awarded the University of Washington College of Engineering teaching and Junior Faculty awards.

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Data-Driven Science and Engineering

Machine Learning, Dynamical Systems, and Control

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