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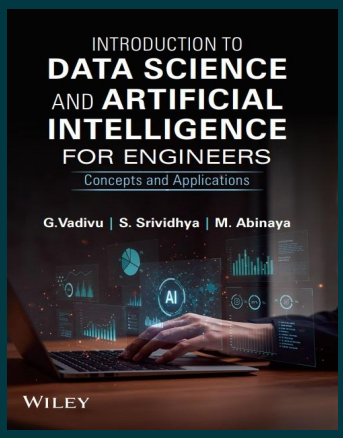


# Introduction to Data Science and Artificial Intelligence for Engineers: Concepts and Applications

By G Vadivu, S. Srividhya, M. Abinaya

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## Description

Introduction to Data Science and Artificial Intelligence for Engineers: Concepts and Applications gives first-year engineering students a structured, application-oriented introduction to data, artificial intelligence, and responsible engineering practice. It's written for a single foundation course and follows one clear arc, from what data is through to what a responsible engineer does with it.

The early chapters cover data, its sources, the data science lifecycle, cleaning, privacy, and ethical visualization. From there the book moves through the core technologies: machine learning, deep learning, natural language processing, and computer vision. Later chapters open up generative AI, agentic AI systems, and the tools students will meet in industry.

A distinguishing feature is its emphasis on engineering judgment. AI systems are powerful, but they aren't infallible. Chapters on hallucinations and deepfakes make the case for verification, and the discussion of agentic AI shows how systems increasingly act on their own. The book culminates in a framework for AI safety built on six principles: safety, fairness, transparency, privacy protection, accountability, and accessibility.

Designed for outcome-based education, the text integrates learning objectives, mini-projects, and application-based exercises that support active learning. Real-world examples across mechanical, civil, electrical, electronics, chemical, biomedical, automobile, and computer science engineering make sure every student sees their own discipline in the material. The result equips students to use AI tools well and to make informed, responsible decisions in their engineering careers.

## About the Author

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