

Data Understanding, Data Analysis, and Data Science

Volume 1 – Prelude to Data Understanding

Begin your multidisciplinary journey into data science with **Prelude to Data Understanding**, the first volume in Patrick Boily's **Data Understanding, Data Analysis, and Data Science** series. Developed in collaboration with experienced practitioners and scholars, this volume serves as both a reference manual and a hands-on resource, ideal for learners with backgrounds in mathematics, statistics, computer science, and related fields.

The chapters cover essential foundations, including programming, multivariate calculus, linear algebra, numerical methods, probability, regression, time series analysis, and survey sampling. Practical examples, exercises, and a tool-agnostic approach help readers build lasting comprehension rather than relying on rote application.

Instead of prescribing a single correct method, the volume highlights the analyst's role in shaping outcomes and encourages thoughtful decision-making. Whether used alongside guided instruction or as a stand-alone resource, **Prelude to Data Understanding** provides a flexible and rigorous introduction to the complexity and richness of data work.

About the Author



Patrick Boily is an Assistant Professor in the Department of Mathematics and Statistics at the University of Ottawa. He earned his Ph.D. in Mathematics in 2006 and is the author of several textbooks on mathematics, statistics, and data science, available at idlewyldanalytics.com.

Since 1999, he has taught more than 75 courses at the University of Ottawa, the Université du Québec en Outaouais, and Carleton University. From 2008 to 2012, he served as a federal public servant, contributing to several projects including the award-winning Canadian Vehicle Use Study. From 2012 to 2019, he launched and managed Carleton University's Centre for Quantitative Analysis and Decision Support (CQADS), and he is a founding member of the Data Action Lab, which offers workshops, short courses, and consulting services in data analysis.

Patrick's academic work focuses on the application of mathematics and statistics to evidence-based decision support. He has provided consulting services to a wide range of public and non-profit organizations, including United Way, the Public Health Agency of Canada, the Canadian Air Transport Security Authority, and the Department of National Defence. His areas of expertise include operations research, data science and predictive analytics, stochastic modelling, and simulation.

Patrick is an avid hockey player, cross-country skier, cyclist, mountain biker, and swimmer; he enjoys crosswords, playing the guitar, and watching British murder mysteries. He lives with his family in Wakefield, Quebec.