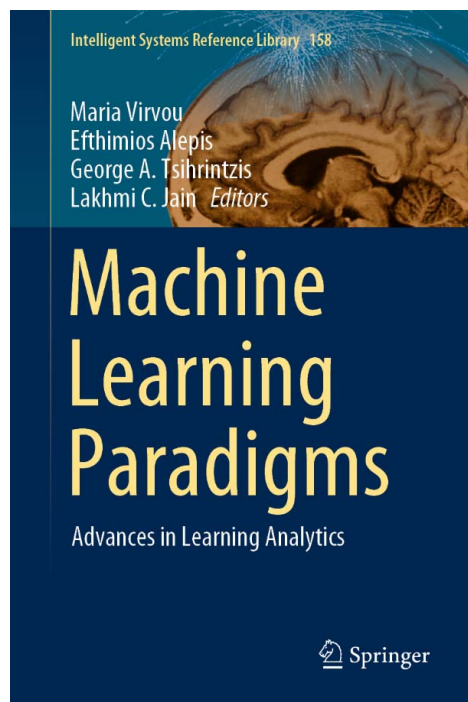# Book Review

Machine Learning Paradigms – Advances in Learning Analytics
Editors: Virvou, Maria; Alepis, Efthimios; Tsihrintzis, George A.; Jain, Lakhmi C.
Springer 2020, pp. 223, ISBN 978-3-030-13742-7
Vol. 158 in Springer Book Series entitled *Intelligent Systems Reference Library*
https://www.springer.com/series/8578

As a secondary education teacher in my early career and as University Professor for the past two decades, I have devoted a great portion of my professional life to educating young people and supervising their learning progress, both ways: in-person and distance learning. Throughout the same period, I have been an active researcher and contributor in both understanding the ways humans learn and in the use of Artificial Intelligence and Information and Communication Technologies to improve teaching and education. Furthermore, and in my capacity as Associate Editor-in-Chief for more than

a decade and (recently appointed) Editor-in-Chief of the *International Journal of Artificial Intelligence Tools*, I have been following the evolution of those technologies very closely and I have often reviewed important related research results and contributions.

A few months ago, I came across a copy of the recent edition by Professors Virvou, Alepis, Tsihrintzis and Jain. I was intrigued by the reference to *Learning Analytics*, a new field that has emerged over the recent years and promises to transform educational systems. Specifically, Learning Analytics is concerned with the collection and processing of data from both educators and learners in order to extract useful information that will improve and, perhaps, even optimize education and learning systems. As such, Learning Analytics is a sub-field of *Machine Learning* and makes use of current Machine Learning and, more generally, Artificial Intelligence methodologies.

At the moment, the field of Learning Analytics is broad and, to a large extent, undefined. Researchers around the Globe investigate different aspects of Learning Analytics, while new approaches and aspects emerge constantly. Books covering all these aspects have been missing from the relevant literature. The Editors have collected chapters which were invited and authored by world-class researchers recognized for their research contributions in various aspects of Learning Analytics.

Overall, the book discusses an impressively broad number of topics in Learning Analytics and exposes its readers to the full spectrum of related research problems and progress. Specifically, the book consists of an editorial/introductory chapter and additional 10 chapters, coherently organized into four parts:

– *Learning Analytics with the purpose to measure Student Engagement, to quantify the Learning Experience and to facilitate Self-Regulation* (3 chapters),
– *Learning Analytics to predict Student Performance* (2 chapters),
– *Learning Analytics incorporated in Tools for Building Learning Materials Educational Courses* (3 chapters) and

– *Learning Analytics as Tools to support Learners and Educators in Synchronous and Asynchronous e-Learning* (2 chapters).

Each chapter is carefully written to be self-contained and complete. Field specialists, i.e. Professors, graduate students and researchers in Learning Analytics, will find this book as a valuable resource for conducting their research. I am confident that general readers with an interest in Educational Technologies will also benefit from this book, as it will present to them a wide spectrum of the current state-of-the-art and inspire them to probe deeper into the fascinating field of Learning Analytics. Finally, I believe that this book will help all readers develop and implement Learning Analytics-based systems in practice.

In summary, I congratulate the Editors for their outstanding work. I consider their book as an important addition to the Learning Analytics literature and I provide my highest and unreserved recommendation to it.

Prof.-Dr. Ioannis Hatzilygeroudis
University of Patras
Patra, Greece