BOOK REVIEW

Foundations of Artificial Intelligence in Healthcare and Bioscience

Author: Louis J. Catania, OD, FAAO
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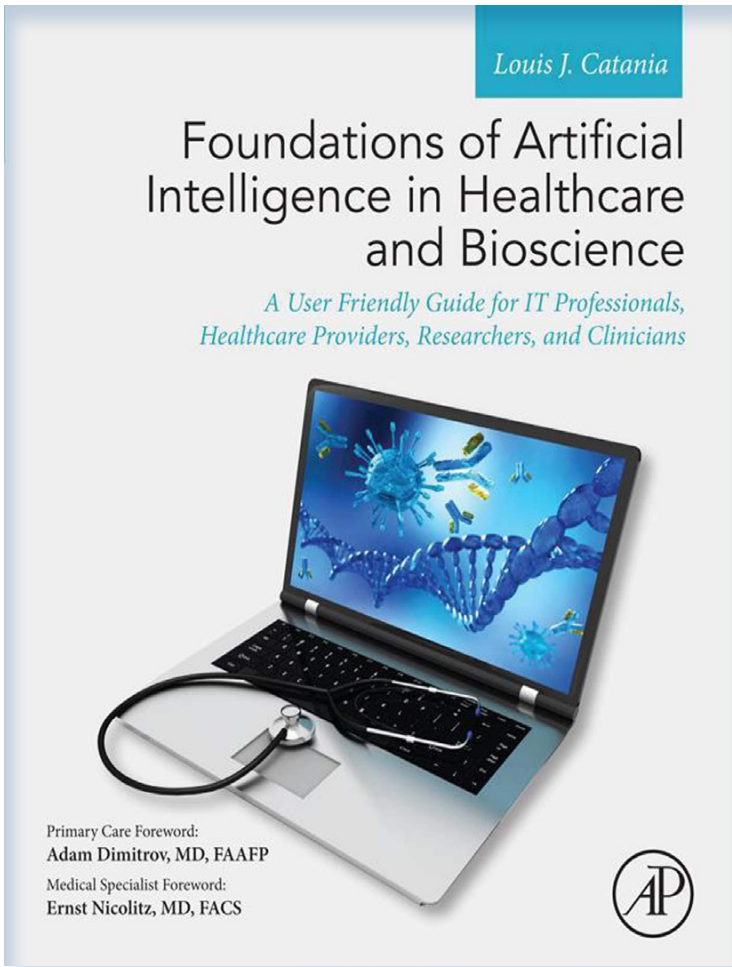

Dr. Lou Catania has done it again! Following his work in the eyecare field, where he has chosen complex and intimidating medical topics and transformed them into logical and intellectually digestible segments for the practicing clinician, this book achieves the same goal for Artificial Intelligence (AI). For most clinicians, the mention of AI conjures up robots and androids taking over the medical field and relegating the doctor to dusting test tubes. In fact, after reading this book we learn that the opposite is true. The author reviews the evolution of AI as the logical extension of computer technology and demonstrates the value of this tool in assisting doctors and health scientists to achieve better outcomes and new goals never before thought possible.

The first section of the book is a primer for anyone in health care or bioscience. In the first two chapters, the author walks us through the basics of a computer components and makes a logical comparison to the human brain. In chapter three, we get a detailed look at machine learning and deep learning and although the math gets a little deep for a clinician, the overall thread holds together and allows the reader to get through with enough knowledge to follow the process. The rest of the chapter introduces advanced concepts such as big data and blockchain and leads into robotics and some practical examples that pull it all together. He also uses the practical example of self-driving vehicles and explains how the five levels of vehicle automation bring in each of the elements of AI.

The second section delves into how AI interfaces with the various sectors of healthcare. Starting with the business and administration the author smoothly moves to diagnostics and technology services. He then moves to a service-based review with topics such as hospitals, nursing care, surgical robotics, genetic and stem cell based work. In each of these areas, there are examples of basic AI strategies coupled with some extrapolation on how more advance AI could improve outcomes.

Starting with chapter seven, the author looks at individual disease such as cancer and diabetes and points out the power and promise of AI technology for prevention and treatment. In the final chapter, clearly added on during the escalation of the COVID-19 pandemic, he explains the history and mechanisms of pandemics. From this point the application of AI based strategies are weaved into the public health response,

the development and application of m-RNA vaccine technology and the prevention of future outbreaks.

This well referenced book has a dual role for clinicians and scientists. First, It provides a concise overview of computers and AI that demystifies this important tool. And secondly, it will serve as a reference book for the applications of AI technology for many areas of healthcare.

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Dr. Scott Edmonds is the Co-Director of the Low Vision/Contact Lens and Acquired Brian Injury Rehabilitation Service at Wills Eye Hospital and the Chief Eye Care Officer at United Healthcare. He is a clinical professor at Western University of Health Sciences- College of Optometry and a member of the adjunct faculty of the Pennsylvania College of Optometry at Salus University. He is member of the Allied Medical staff of the Lankenau Hospital. He has written and lectured extensively on clinical and public health topics.

Dr. Edmonds is a past President of the Philadelphia Optometric Society, the Chester Delaware Optometric Society and the 1988 President of the Pennsylvania Optometric Association. He has served as the Chairman of a number of committees for the American Optometric Association and has recently completed two terms on the American Council on Optometric Education.

Dr. Edmonds was honored by the Pennsylvania College of Optometry as the Preceptor of the Year in 1983. He was honored as the Optometrist of the Year in 1985 by the Philadelphia Optometric Society and again in 2008 by the Chester-Delaware Optometric Society. He was the honored as the Pennsylvania Optometric Association Optometrist of the Year in 2008 and the 2016 winner of the Dr. Jerry P. Davidoff Memorial Award for Leadership Service. He is the winner of a Apex Award for publication excellence for his HEALIO blog on healthcare reform.