

# Preface

I began doing research on machine learning when I started working with a company's research laboratory. It was more than 25 years ago. The company believed in that machine learning would be helpful for the company business in the future, and the research group of only a few people started working on machine learning research in the company, just one year before I joined the company. I'm not working with that company any more, while the company's expectation would have been correct. Machine learning, currently a major part of artificial intelligence (AI), is not only useful for development of science and technology but also a key driving force for advancing our society. In reality, our life has changed or is changing by many AI-based autonomous technologies, including robotics, security-alert systems, face recognition, self-driving, etc. Eventually our life will be redefined by the advancement of AI in the near future. The research laboratory where I joined more than 25 years ago has a machine learning research group still now, while the big difference from 25 years ago is that the current research group has more than 100 people.

At that time my work was not doing research only. I visited customer companies to talk over their data and requests on what they want to know from the data. Also my visit of customer companies was not only just for talking and meeting, but also for doing more substantial work, like running machine learning software (developed by my group) over the data owned by customers. The customer data were confidential and I was unable to carry the data out of customer companies, and then I had to stay at each customer company on the whole day, or commute there all a week or entire a month. As such I tackled many problems, which customer companies had and provided. Of course they were not always issues in marketing, but some of them were definitely on marketing. A typical example is customer churn analysis, campaign management to increase loyal customers, etc. I worked on the churn problem with many customers, which include internet service providers, mobile phone carriers, E-commerce (electric commerce) site developers, etc. Although I tackled such problems in marketing, honestly I had no good knowledge on marketing and more importantly no systematic understanding of marketing. In other words, I had no comprehensive understanding on what and how I could contribute to the customer companies or more generally the society, though practically problems I tackled could be solved by machine learning software we provided.

Six years ago, I had a chance to work with a sort of companies in one project,

which builds a database to be shared by them and generates software to retrieve useful knowledge from the database. I worked as a consultant in this project, which reminds me a lot of past experiences when I was working with a company and also customers. First I noticed my knowledge on business was definitely limited, which made me, being involved with this project, start reading a lot of textbooks, mainly used in regular courses of Master of Business Administration (MBA). Reading these books, which are sometimes on marketing, I noticed that a wide variety of aspects of marketing can be changed to be done in a more systematic manner by using “data”. In other words, machine learning would be useful for a lot of points of marketing to which machine learning or AI has not been considered to apply yet. In fact, each step of target marketing, i.e. segmentation, targeting and positioning, can be autonomous by using AI, if marketing strategies are properly formulated into mathematical problems and also good amount of high-quality data are given. For example, an important objective of marketers in target marketing can be interpreted as a problem of finding the market segments which have a good number of customers but have no powerful competitors. This objective can be formulated into a machine learning problem, in which parameters can be optimized from data. This is exactly the work of machine learning and then autonomous AI. Relationship marketing would be more so, because customer purchase records are more abundant and also accessible. These data are definitely useful to solve machine learning problems set for relationship marketing by optimizing model parameters. In short machine learning over such data would be able to show what marketers want to see or directly perform what marketers want to do. This would be reasonable, while I then checked a sort of academic journals on marketing and related fields and noticed that machine learning has not been used for marketing yet extensively or we are just standing at the entrance of the world of autonomous marketing by machine learning or artificial intelligence.

This book covers many aspects and problems derived from marketing, particularly rather traditional or standard marketing, for which machine learning can be applied to solve. Some of them would be already well known, while I think most of them are not necessarily so. I would be happy if this book contributes to using machine learning more widely for marketing than now.

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