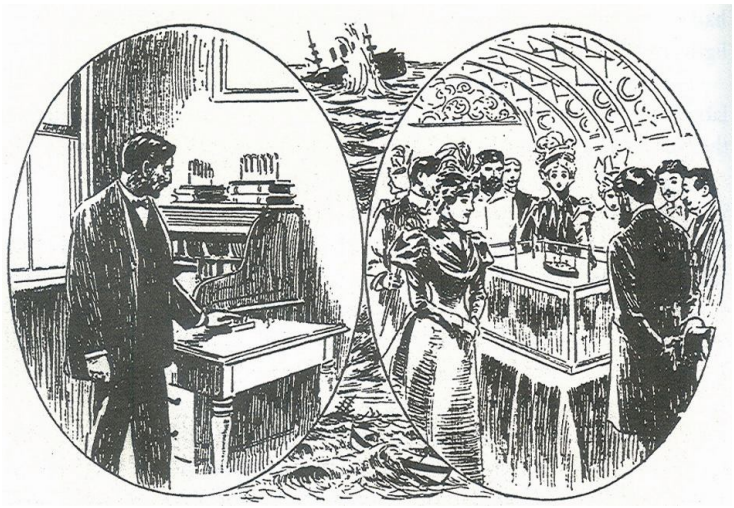

Newspaper sketch showing how Tesla planned to demonstrate his radio-controlled boat at the Paris Exposition.

the common society too. Carlson has held all these out in great detail. In his book here onwards, wherever the scope rose, Carlson has dealt with legal and financial complexities in excessive detail. However, to this reviewer, these lengthy accounts of legal/financial processes that either propped up Tesla in his heydays (1886–1895) or sunk him (1896–1905), appeared irrelevant at times. The same may be felt by some readers also with purely technical background, especially for an Indian mind.

As a celebrity, Tesla was now amongst the lords of the American society. Mark Twain and Joseph Jefferson were now among his close friends and admirers. So were many more stars of the then American society. The next major turning point was soon to follow in Tesla's life. Though his talent promised to become all the more productive, ironically the circumstances had turned around for the worse. Carlson holds out facts establishing that Tesla believed in his technical powers so much that he overlooked the signals of failing circumstances. He ventured upon a revolutionary wireless power and signal transmission concept (chapters 12 and 13) fired on by startling experimental success in the initial stages (chapter 10). In 1899, it is clear from the details (chapter 12) that Tesla spent one of the most productive R&D years of his life – deep and original scientific thinking, followed by precise calculations, setting up of insightful experiments, intense experimental verification and above all, boundless satisfaction of corroboration of one's own hypothesis – at the Pikes' Peak, Colorado Springs. He took up building one of the most futuristic and expensive technological apparatus that any lone scientist–engineer has ever dreamt of. It was that of wireless transmission of electrical power throughout the globe, using stationary waves at around 6.6 Hz through earth. Few years back, this reviewer had the fortune of going through Tesla's diary of the work he did that year (*Notes from Colorado Springs: 1899–1900*, Nolit Publishers, 1977). With advanced understanding and technology, mankind is now reconsidering those plans. Tesla was clearly hundreds of years ahead of his time in his vision and technical skill.

Tesla's technological apparatus required huge financial and logistic support. In the meantime both Peck and Brown, who assisted his meteoric rise, were no more. The magnanimous financier of those early years, Westinghouse, had also left this world. That these were indications enough for not venturing on, was one thing that Tesla never seemed to accept. Hence he relied on new-age promoters and financiers – J. J. Astor, the aristocrat, and the famed J. P. Morgan of Wall Street. No wonder, in spite of their track record in promoting/financing daring projects, they could hardly sense the expanse of Tesla's vision and hence remained apprehensive about the venture. To add to their apprehension was one of the greatest drawbacks of Tesla – ranting narcissism. Thus, after a promising start financed by Morgan, the 'Wardenclyffe' project (chapter 14) had to be rejected (chapter 15). Tesla remained a 'Visionary to the end' (chapter 16) till his death in 1943, a debt-ridden almost penniless man: ever over-optimistic, reciting umpteen novel technical contraptions. It appears from the book, that apart from lack of finance and his over-confidence, the two World Wars were the other culprits for cutting short his technical career.

Barring the use of a few technically erroneous terms at a few places, maybe due to simple oversight or common malapropism, Carlson has done an eminently admirable job in authoring this book. A co-author in the form of an electrical engineer would have surely made this book a masterpiece for all ages. Else, the numerous technical drawings remain unutilized. Carlson's reverence for Tesla, though skillfully concealed in language, is writ large all over the book in terms of the painstaking effort he has put behind this work. The way Carlson has presented the facts, instead of forwarding his personal views, has made his tenderness for Tesla, the architect of a new electrical age, subtly evident. The book is an essential asset for any library, particularly for universities and institutions of science, engineering and technology.

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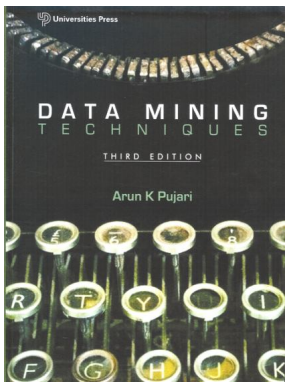

Data Mining Techniques. Arun K. Pujari. Universities Press (India) Private Limited, 3-6-747/1/A and 3-6-754/1, Himayatnagar, Hyderabad 500 029. 2013. 3rd edn. xxii + 366 pp. Price: Rs 350.

The book under review provides an excellent introduction to data mining. Currently, there are several initiatives on

big data from both academia and industry. Several academic institutions in the country offer courses both at undergraduate and graduate level on data mining. Also, there is a sustained interest from industry on data science; specifically there is a growing demand for data scientists. In this context, the book under review is a welcome addition to the existing collection of good books on data mining.

I could successfully use a part of the first edition of the book to teach a graduate-level course on data mining. Specifically material covered on association rule mining, clustering and decision trees was state-of-the-art. Further, it was the only book on the topic which had provided exercises at the end of various chapters. Most of the important contributions were covered in the discussion and an excellent set of references were provided at the end of each chapter. In the second edition, a chapter on rough sets was added, which is useful in soft computing.

In the current edition, the discussion on data warehousing is significantly enriched and a collection of some of the state-of-the-art references on this topic is provided. A popular soft computing tool in the form of genetic algorithms is examined in more detail. This edition can be used as a textbook for an undergraduate course on data mining and warehousing. However, the references provided at the end of chapters 4 to 11 correspond to publications that appeared before 2001. In order to make the book more useful to the current-day needs, the author may consider adding material on bagging, boosting, random forests, naïve Bayes classifier, topic models and map-reduce implementations in the future editions.

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Annual Review of Microbiology, 2013. Susan Gottesman, Caroline S. Harwood and Olaf Schneewind (eds). Annual Reviews, 4139 El Camino Way, P.O. Box 10139, Palo Alto, California 94303-0139, USA. Vol. 67. xi + 653 pp. Price: US$ 92.

From my graduate student days, I remember, the *Annual Reviews* was one of the most sought-after reading material on a given topic. Over the years, with the explosion in publishing, a number of other review journals have surfaced, but the *Annual Reviews* have retained their celebrated status. The *Annual Review of Microbiology* (*ARM*), started in 1947, generally covers significant developments on a number of subjects in microbiology. The 30 reviews in this book deal with a whole range of diverse topics reflecting the long history of the subject and the revived (read revolution) interest to explore and understand microbial systems. Typically set in *Annual Review* mould, the reviews range from personal reflections on lac operon-based reporter systems, quorum sensing (QS), transcriptional regulation, biofilms, asymmetric bacterial growth, genomics, gut micro biome, microbial interactions, resistance and response regulation mechanisms. Reviews on archearal, viral and microbial eukaryotes are included in good measure to complete a comprehensive volume.

Personal reminiscence from an established investigator dwelling on lifetime achievement has been a characteristic opening review in this series. I have found such autobiographical scientific revelations inspirational and the review entitled 'Fifty years fused to lac' by Jonathan Beckwith is the top of the chart story. He describes the genetic fusions, wherein lac operon of *Escherichia coli* is fused to other genes and the use of such fusions to study various problems in biology. For those engaged in microbial genetics research and the students of biology, this is a must-read article.

Transcription and its regulation has been a subject of a large number of reviews. The article by Decker and Hinton attempts to compare the transcription initiation process between bacteria, archaea and eukaryotes. Strategies used for promoter recognition as well as to alter core promoter specificity across the three branches of the phylogenetic tree are compared and parallels are drawn. Given the extensive literature in this field, the authors' task was challenging and hence some of the mechanistic details are inadequately described. In contrast, the review on 3′-cap-independent translation enhancers (CITES) of plant viruses provides a comprehensive account of this emerging subject. The variant CITES and their mechanism of action are described. The emergence of recombinant form which may facilitate avoiding resistance and increase viral host range is presented. In the two articles dealing with QS and biofilms, two contrasting overviews are presented. The first one reviews the vast body of literature on acyl-homoserine lactose-mediated signalling, which has been the paradigm for QS and the development of QS-inhibitory drugs. In contrast to the wealth of information on biofilm in eubacteria, very little is known on archaeal biofilm formation, although they are ubiquitously present in every possible habitat. The second review basically summarizes the current state of limited knowledge on archaeal biofilms formation – an emerging topic.

A scholarly review is presented on consequences and advantages of asymmetric bacterial growth by Brun and colleagues. While asymmetric growth and division has been well studied in *Bacillus* sporulation or *Caulobactor* cell cycle, the review also dwells on other kinds of asymmetry, utility and importance, and evolutionary aspects.

The following five articles deal with microbial interactions either as complex communities or specific interacting partner organisms or viruses. From the surge in literature in the last several years, it is apparent that metagenomic approaches have revolutionized the study of microbiology. Large-scale gut microbial genome sequencing efforts and culture-independent analysis of gut microbiome have generated a massive amount of data, with many startling findings. These studies have opened up new avenues to understand the mechanism of host–microbe interaction. Thus, the review on experimental approaches for defining the functional roles of microbes in the human gut deals with newer strategies to understand and utilize the vast body of information to explore the application potential. In a fascinating review on a biological tug of war between host neutrophils and human pathogen *Staphylococcus aureus*, the authors describe the elaborate steps involved in neutrophil recruitment, chemotaxis, their priming and activation to