## SOCIAL NETWORK WITH RICH EDGE SEMANTICS

By Quan Zheng and David Skillicorn, Chapman & Hall/CRC, 2017, ISBN 978-1-138-03243-9, hardcover, 210 pages

Reviewer: Krzysztof Rusek

As humans, we build various types of relationships with one another. The main topic of this book is the analysis and understanding of the social networks formed by such relationships. Much of the attention is put onto the understanding of rich semantics of the social relation that can be symmetric, asymmetric, positive, negative, or even evolving over time.

The book is organized into 10 chapters. The first two chapters introduce the concept of a social network and its core model based on layered graphs. Layers are the key tool used through the entire book for modelling multiple aspects of the relationships. Briefly described, a layer is a sub-graph representing some particular aspect of the relationships in the network. Multiple layers are connected into a single graph capturing rich edge semantics. A multi-layered graph is analyzed using graph embedding techniques described in the subsequent chapter.

The third chapter provides all the necessary graph theory background including spectral graph embedding, being a primary tool used by the authors for network analysis. The theory is presented in an easy way. The amount of information is just enough to understand the remainder of the book without the necessity to look to additional references. More technical aspects are discussed in the appendices. This chapter on its own is also a good starter for spectral graph analysis for layman readers.

Starting from Chapter 4, the authors gradually apply the layered graph approach to more and more complicated (and more realistic) relationships. The authors begin by allowing for different types of relationships (such as friends or a family). Later, they consider the asymmetric relationships (which can also be of different types). This is an important case, as real relationships are often asymmetric. The elegance and power of the layered approach is given in Chapter 7, which describes relationships changing over time. The network at each time step is just a new layer, and the whole graph is analyzed in a standard way. In real life, among typed or directed, the relation can be positive or negative. The model for such relationships is presented in Chapter 8. The subsequent chapter describes a useful application of this model for semi-supervised learning from partially labeled and unbalanced data. Since much real data is only partially labeled and typically labels are unbalanced, this chapter may be useful for a data scientists working with this type of data. The final chapter deals with the relationships that can be both directed and signed.

The book is well organized and self-contained; however, each chapter extends the preceding ones with some aspects. Thus, it is recommended to read the book in the order as written, especially if a reader is unfamiliar with the topic. More advanced readers can pick just the interesting chapters.

To sum up: the book is well organized and self-contained; however, each chapter extends the preceding ones with some aspects. Thus, it is recommended to read the book in the order as written, especially if a reader is unfamiliar with the topic. More advanced readers can pick just the interesting chapters. It must be noted that the book covers a classical spectral graph analysis with little to no information about alternatives, such as deep learning in social networks. In my opinion, the reader who will benefit most from this text is a practitioner faced with the problem of knowledge discovery from some data regarding social interaction. The models described in the book allow for realistic relationship modelling. Many practical examples and supplementary MATLAB codes makes it easy for a reader to begin with their own analysis. MATLAB code can also be appreciated by a reader who prefers reading the code rather than dealing with the mathematical formulas.



**Professor/Associate Professor/Assistant Professorship in the Department of Electrical and Electronic Engineering**

The Department of Electrical and Electronic Engineering at the Southern University of Science and Technology (SUSTech) now invites applications for the faculty position in the Department of Electrical and Electronic Engineering. It is seeking to appoint a number of tenured or tenure track positions in all ranks.

Candidates with research interests in all mainstream fields of electrical and electronic engineering will be considered, including but not limited to IC Design, Embedded Systems, Internet of Things, VR/AR, Signal and Information Processing, Control and Robotics, Big Data, AI, Communication/Networking, Microelectronics, and Photonics. These positions are full time posts. SUSTech adopts the tenure track system, which offers the recruited faculty members a clearly defined career path.

Candidates should have demonstrated excellence in research and a strong commitment to teaching. A doctoral degree is required at the time of appointment. Candidates for senior positions must have an established record of research, and a track-record in securing external funding as PI. As a State-level innovative city, it is home to some of China's most successful high-tech companies, such as Huawei and Tencent. We also emphasize entrepreneurship in our department with good initial support. Candidates with entrepreneur experience is encouraged to apply as well.

To apply, please send curriculum vitae, description of research interests and statement on teaching to eehire@sustc.edu.cn. SUSTech offers internationally competitive salaries, fringe benefits including medical insurance, retirement and housing subsidy, which are among the best in China. Salary and rank will commensurate with qualifications and experience.

More information can be found at **http://talent.sustc.edu.cn/en** and **http://eee.sustc.edu.cn/en**. Candidates should also arrange for at least three letters of recommendation sending directly to the above email account. The search will continue until the position is filled.

For informal discussion about the above posts, please contact Chair Professor Xiaowei SUN, Head of Department of Electrical and Electronic Engineering, by phone 86-755-88018558 or email: sunxw@sustc.edu.cn.

To learn more about working & living in China, please visit: **http://www.jobs.ac.uk/careers-advice/country-profiles/china**.