



Autonomous Learning Systems: From Data Streams to Knowledge in Real-time

Plamen Angelov

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DESCRIPTION

Autonomous Learning Systems is the result of over a decade of focused research and studies in this emerging area which spans a number of well-known and well-established disciplines that include machine learning, system identification, data mining, fuzzy logic, neural networks, neuro-fuzzy systems, control theory and pattern recognition. The evolution of these systems has been both industry-driven with an increasing demand from sectors such as defence and security, aerospace and advanced process industries, bio-medicine and intelligent transportation, as well as research-driven – there is a strong trend of innovation of all of the above well-established research disciplines that is linked to their on-line and real-time application; their adaptability and flexibility.

Providing an introduction to the key technologies, detailed technical explanations of the methodology, and an illustration of the practical relevance of the approach with a wide range of applications, this book addresses the challenges of autonomous learning systems with a systematic approach that lays the foundations for a fast growing area of research that will underpin a range of technological applications vital to both industry and society.

Key features:

- Presents the subject systematically from explaining the fundamentals to illustrating the proposed approach with numerous applications.
- Covers a wide range of applications in fields including unmanned vehicles/robotics, oil refineries, chemical industry, evolving user behaviour and activity recognition.

- Reviews traditional fields including clustering, classification, control, fault detection and anomaly detection, filtering and estimation through the prism of evolving and autonomously learning mechanisms.
- Accompanied by a website hosting additional material, including the software toolbox and lecture notes.

Autonomous Learning Systems provides a 'one-stop shop' on the subject for academics, students, researchers and practicing engineers. It is also a valuable reference for Government agencies and software developers.

ABOUT THE AUTHOR

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Plamen Parvanov is a senior lecturer in the School of Computing and Communications at Lancaster University. He is an Associate Editor of three international journals and the founding co-Editor-in-Chief of the Springer journal *Evolving Systems*. He is also the Vice Chair of the Technical Committee on Standards, Computational Intelligence Society, IEEE and co-Chair of several IEEE conferences. His research in UAV/UAS is often publicised in external publications, e.g. the prestigious *Computational Intelligence Magazine*; *Aviation Week*, *Flight Global*, *Airframer*, *Flight International*, etc. His research focuses on computational intelligence and evolving systems, and his research in to autonomous systems has received worldwide recognition. As the Principle Investigator at Lancaster University for a team working on UAV Sense and Avoid fortwo projects of ASTRAEA his work was recognised by 'The Engineer Innovation and Technology 2008 Award in two categories: i) Aerospace and Defence and ii) The Special Award which is an outstanding achievement.

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