



Hidden Semi-Markov Models: Theory, Algorithms and Applications

By Shun-Zheng Yu

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Hidden semi-Markov models (HSMMs) are among the most important models in the area of artificial intelligence / machine learning. Since the first HSMM was introduced in 1980 for machine recognition of speech, three other HSMMs have been proposed, with various definitions of duration and observation distributions. Those models have different expressions, algorithms, computational complexities, and applicable areas, without explicitly interchangeable forms.

Hidden Semi-Markov Models: Theory, Algorithms and Applications provides a unified and foundational approach to HSMMs, including various HSMMs (such as the explicit duration, variable transition, and residential time of HSMMs), inference and estimation algorithms, implementation methods and application instances. Learn new developments and state-of-the-art emerging topics as they relate to HSMMs, presented with examples drawn from medicine, engineering and computer science.

- Discusses the latest developments and emerging topics in the field of HSMMs
- Includes a description of applications in various areas including, Human Activity Recognition, Handwriting Recognition, Network Traffic Characterization and Anomaly Detection, and Functional MRI Brain Mapping.
- Shows how to master the basic techniques needed for using HSMMs and how to apply them.

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Editorial Review

Review

"This book is intended to present theory, models, methods, and applications regarding hidden semi-Markov models...It also provides the latest development and emerging topics concerning this field." --**Zentralblatt MATH**, *Hidden Semi-Markov Models*

From the Back Cover

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About the Author

Shun-Zheng Yu is a professor at the School of Information Science and Technology at Sun Yat-Sen University, China.. He was a visiting scholar at Princeton University and IBM Thomas J. Watson Research Center from 1999 to 2002. He has authored two hundred journal papers that used artificial intelligence/machine learning methods for inference and estimation, among which fifty papers involved hidden semi-Markov models. Professor Yu is a well-recognized expert in the field of HSMMs and their applications. He has developed new estimation algorithms for HSMMs and applied them in various fields. The papers entitled "Hidden Semi-Markov Models (2010)" Published in the Elsevier Journal Artificial Intelligence , "Practical Implementation of an Efficient Forward-Backward Algorithm for an Explicit Duration Hidden Markov Model (2006) published in IEEE Signal Processing Letters", "A Hidden Semi-Markov Model with Missing Data and Multiple Observation Sequences for Mobility Tracking (2003)" Published in the Elsevier Journal Signal Processing and " An Efficient Forward-Backward Algorithm for an Explicit Duration Hidden Markov Model (2003) published in IEEE Signal Processing Letters " have been cited by hundreds of papers.

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