1. Record Nr. UNINA9910828417703321 Autore Ghosh Lidia **Titolo** Cognitive modeling of human memory and learning: a non-invasive brain-computer interfacing approach / / Lidia Ghosh, Artificial Intelligence Lab., Dept. of Electronics and Tele-Communication Engineering, Amit Konar, Artificial Intelligence Lab., Dept. of Electronics and Tele-Communication Engineering, Pratyusha Rakshit, Artificial Intelligence Lab., Dept. of Electronics and Tele-Communication Engineering Pubbl/distr/stampa Hoboken, New Jersey:,: Wiley,, [2020] [Piscatagay, New Jersey]:,: IEEE Xplore,, [2020] **ISBN** 1-119-70591-6 1-119-70587-8 1-119-70592-4 Descrizione fisica 1 online resource (275 pages) Disciplina 153.12 Soggetti Memory Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references and index. Chapter 1: Introduction to Human Memory and Learning Models -- 1.1 Nota di contenuto Introduction 2 -- 1.2 Philosophical Contributions to Memory Research 4 -- 1.2.1 Atkinson and Shiffrin's Model 4 -- 1.2.2 Tveter's Model 6 --1.2.3 Tulving's model 6 -- 1.2.4 The Parallel and Distributed Processing (PDP) Approach 8 -- 1.2.5 Procedural and Declarative Memory 9 -- 1.3 Brain-theoretic Interpretation of Memory Formation 11 -- 1.3.1 Coding for Memory 11 -- 1.3.2 Memory Consolidation 13 -- 1.3.3 Location of stored Memories 16 -- 1.3.4 Isolation of Information in Memory 16 -- 1.4 Cognitive Maps 17 -- 1.5 Neural Plasticity 18 -- 1.6 Modularity 19 -- 1.7 The cellular Process behind STM Formation 20 -- 1.8 LTM Formation 21 -- 1.9 Brain Signal Analysis in the Context of Memory and Learning 22 -- 1.9.1 Association of EEG alpha and theta band with memory performances 22 -- 1.9.2 Oscillatory beta and gamma frequency band activation in STM performance 26 -- 1.9.3 Change in EEG band power with changing

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## Sommario/riassunto

"This book models human memory from a cognitive standpoint by utilizing brain activations acquired from the cortex by electroencephalographic (EEG) and functional near-infraredspectroscopic (f-NIRs) means. It begins with an overview of the early models of memory. The authors then propose a simplistic model of Working Memory (WM) built with fuzzy Hebbian learning. A second perspective of memory models is concerned with Short-Term Memory (STM)-modeling in the context of 2-dimensional object-shape reconstruction from visually examined memorized instances. A third model assesses the subjective motor learning skill in driving from erroneous motor actions. Other models introduce a novel strategy of designing a two-layered deep Long Short-Term Memory (LSTM) classifier network and also deal with cognitive load assessment in motor learning tasks associated with driving. The book ends with concluding remarks based on principles and experimental results acquired in previous chapters"--