

Introduction :-

This book invites a broad collection of chapters covering different aspects of computational modelling efforts in Brain and behaviour computing applicable in the area of psychology and neuroscience. Specifically, it covers medical devices and engineering theories and techniques required for brain diseases and disorder detection and identifications. It provides in-depth coverage of models of psychiatric disorders, including depression, posttraumatic stress disorder (PTSD), schizophrenia, and dyslexia; models of neurological disorders, including Alzheimer's disease, Parkinson's disease, epilepsy etc.

Brain and Behavior Computing divided into fifteen chapters the key feature of this book is :

1. Brain data acquisition in the form of signals, images or any other forms obtains from different devices present now a day and different issues and challenges associated with this process.
2. Standards for acquiring brain signalling techniques and its specification and comparisons.
3. Brain monitoring techniques different devices like ERP/SSVEP/P300 etc role in this area.
4. Data Science contributes in this area to supports Data Analysis (DA), Information Extraction (IE), Information Retrieval (IR) etc is required implication of brain and behaviour computing.
5. Data science is fast-growing across the neuroscience field. In this Short Course, leading experts teach basic data skills that all neuroscientists should know and detail advanced data science methods that can be used in different circumstances.

Proposed Table of Contents

Chapter No.	Chapter Title	Chapter Subtitle
1	Introduction and Data acquisition	<ul style="list-style-type: none"> • Introduction and background • Importance of Brain sensors and devices • Implication of brain sensors • Learning Outcomes
2	Classification and Characteristics of brain Computing	<ul style="list-style-type: none"> • Different types of devices • Working model of device • Specifications and comparison • Learning Outcomes
3	Signal Processing techniques and algorithms in brain behavior analysis	<ul style="list-style-type: none"> • Fundamentals of brain Signal Processing • Brain Monitoring Techniques • ERP/SSVEP/ P300 Speller based signal processing • Learning Outcomes
4	Data Science in Brain Signal computing	<ul style="list-style-type: none"> • Brain signal pre-processing • Feature extraction techniques for brain signals • Feature selection techniques for brain signals • Learning Outcomes
5	Image Processing techniques in Brain and Behavior	<ul style="list-style-type: none"> • Introduction to brain imaging techniques • Methods and algorithms for brain Imaging • Applications of brain imaging in disease and disorder detection • Current Trends • Learning Outcomes
6	Brain simulation tools	<ul style="list-style-type: none"> • EEGLAB for brain and Behaviour analysis • Field Trip brain and Behaviour analysis • Other Simulation method for brain and behaviour analysis • Learning Outcomes
7	Role of statistics in brain and behavior science	<ul style="list-style-type: none"> • Introduction to statistics • Statistics for brain data analysis • Statistics for BCI model and machine learning algorithms • Statistics for brain data pre-processing

		<ul style="list-style-type: none"> Statistics for disease and disorder detection Learning Outcomes
8	Visual brain Computing	<ul style="list-style-type: none"> Analysis and synthesis for brain visual images 2D/3D models for brain Imaging Device source localization through visualization Learning Outcomes
9	Parallel, Distributed and Cloud Computing (PDC) in Brain and Behavior Science	<ul style="list-style-type: none"> Introduction to PDC PDC techniques for brain disease and disorder detection Comparative analysis of PDC with Conventional methods Learning Outcomes
10	Machine Learning Techniques for Brain and Behavior Computing	<ul style="list-style-type: none"> Classification Methods Regression Method Clustering Methods Deep Learning for Brain Computing Learning Outcomes
11	Brain Imaging Modalities	<ul style="list-style-type: none"> FMRI for brain analysis PET for brain analysis CT Scan for brain analysis DTI (Diffusion Tensor Imaging) for brain analysis Learning Outcomes
12	Brain-Computer Interface (BCI)	<ul style="list-style-type: none"> BCI with EEG Signals BCI with P300 Signals BCI with SSVEP Signals Applications of BCI Learning Outcomes
13	Psychology and Philosophy aspects of BCI	<ul style="list-style-type: none"> Aspects and the analysis Learning Outcomes
14	Case studies	<ul style="list-style-type: none"> Various case studies related to application of brain computing in all emerging applications Real Time Implementations and Simulations
15	Future Scope for brain and behaviour analysis	<ul style="list-style-type: none"> Continuous research scope in the area of brain and behaviour science Learning Outcomes
