The aim of the Journal is to act as an unbiased and permanent forum for a synthesis of the brain sciences through the auspices of theory and neurogenic or neurosurgical experimentation. The scope of the Journal is broad, encompassing all aspects of integration in the brain. The distinguishing feature of the Journal is to elucidate brain operations across multiple levels in a hierarchy.
### Neuroinformatics: The Integration of Shared Databases and Tools towards Integrative Neuroscience

**Vol. 1 No.2 (2002)**  
Shun-Ichi Amari, Francesco Beltrame, Jan G. Bjaalie,  
Turgay Dalkara, Erik De Schutter, Nigel H Goddard,  
Carmen Gonzalez, Sten Grillner, Andreas Herz, K.  
Peter Hoffmann, Iiro Jaaskelainen, Stephen H Koslow, Soo-Young Lee,  
Line Matthiessen, Perry L Miller, Fernando Mira Da Silva, Mirko Novak, Vijji Ravindranath, Raphael Ritz,  
Ulla Ruotsalainen, Vaclav Sebesta, Shankar Subramaniam, Yiyuan Tang, Arthur W. Toga, Shiro Ueji, Jaap Van Pelt,  
Paul Verschure, David Willshaw, Andrzej Wrobel  
The OECD Neuroinformatics Working Group, Australia  
& Gary F. Egan  
Howard Florey Institute, University of Melbourne, 3010 Australia

**Abstract**  
There is significant interest amongst neuroscientists in sharing neuroscience data and analytical tools. The exchange of neuroscience data and tools between groups affords the opportunity to differently re-analyze previously collected data, encourage new neuroscience interpretations and foster otherwise uninhibited collaborations, and provide a framework for the further development of theoretically based models of brain function. Data sharing will ultimately reduce experimental and analytical error. Many small Internet accessible database initiatives have been developed and specialized analytical software and modeling tools are distributed within different fields of neuroscience. However, in addition large-scale international collaborations are required which involve new mechanisms of coordination and funding. Provided sufficient government support is given to such international initiatives, sharing of neuroscience data and tools can play a pivotal role in human brain research and lead to innovations in neuroscience, informatics and treatment of brain disorders. These innovations will enable application of theoretical modeling techniques to enhance our understanding of the integrative aspects of neuroscience. This article, authored by a multinational working group on neuroinformatics established by the Organization for Economic Co-operation and Development (OECD), articulates some of the challenges and lessons learned to date in efforts to achieve international collaborative neuroscience.

### Controller-Regulator Model of The Central Nervous System

**Vol. 1, No. 2 (2002)**  
Masao Ito  
Brain Science Institute, Riken, Wako, Saitama 351-0198, Japan

**Abstract**  
In the central nervous system, activities of numerous neurons are integrated to constitute a number of major functional blocks, each characterized by unique structural and functional features. Five controller systems are centers of reflexes, compound movements and innate behaviors in the brainstem and spinal cord and those of the sensory/motor and executive/cognitive functions in the cerebral neocortex. Four regulator systems are the sleep-wakefulness centers in the brainstem, cerebellum, basal ganglia and limbic system. This article describes characteristic features of these nine systems based on current knowledge of neuroscience, and attempts to account for several important aspects of the central nervous system (hierarchy, top-down operation, internal model and will) by compounding these component functions.

### Savant-Like Skills Exposed in Normal People by Suppressing the Left Fronto-Temporal Lobe

**Vol. 2, No. 2 (2003)**  
Allan W. Snyder, Elaine Mulcahy, John Mitchell  
Centre for the Mind, The University of Sydney, NSW 2006 Australia  
The Australian National University, ACT 0200, Australia  
Janet L. Taylor, Simon C. Gandevia  
Prince of Wales Medical Research Institute and University of New South Wales, NSW 2031, Australia  
Perminder Sachdev  
Neuropsychiatric Institute, Euro Centre, Prince of Wales Hospital, NSW 2031, Australia

**Abstract**  
The astonishing skills of savants have been suggested to be latent in everyone, but are not normally accessible without a rare form of brain impairment. We attempted to simulate such brain impairment in healthy people by directing low-frequency magnetic pulses into the left fronto-temporal lobe. Significant stylistic changes in drawing were facilitated by the magnetic pulses in four of our 11 participants. Some of these “facilitated” participants also displayed enhanced proofreading ability. Our conclusions are derived from 11 right-handed male university students, eight of whom underwent placebo stimulation. We examined performance before, during and after exposure to the stimulation.
Abstract

Executive deficits due to Alzheimer’s disease (AD) seriously compromise patients’ ability for concurrent manipulation of information. Understanding such deficits must integrate neurophysiological findings, results from dual-task experiments and successful psychological models of the matching of ascending and descending information to direct attention. We considered attention as dependent on an oscillatory matching between what is looked for and what is perceived. Hence we implemented a model of coordination between oscillatory neuroactivity of interconnected cortical units. We simulated executive deficits evident during dual-tasks as a breakdown of intercortical oscillatory coordination. We investigated the hypothesis that this breakdown is due to functional disconnection between cortical areas, by measuring the effect of interfering tasks in control and ‘lesioned’ models. Control models successfully reproduced many features of attention. Several neuropathological mechanisms in AD were found likely to cause functional disconnection. Functional disconnection resulted in much greater impairment of coordination during dual rather than single tasks. This could account for key neurophysiological data from the literature. Executive deficits in AD may thus be partly explained by oscillatory discoordination. Oscillatory coordination phenomena are likely to reflect large scale network interactions in the brain that are concerned with integrative function beyond the specific example considered in this study.
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