Chapter 43

The Coimagination Method and its Evaluation via the Conversation Interactivity Measuring Method

Mihoko Otake  
Research into Artifacts, Center for Engineering The University of Tokyo, Japan

Motoichiro Kato  
Research into Artifacts, Center for Engineering The University of Tokyo, Japan

Toshihisa Takagi  
Database Center for Life Science, Research Organization of Information and Systems, Japan

Hajime Asama  
Department of Precision Engineering, Graduate School of Engineering, The University of Tokyo, Japan

ABSTRACT

The causes of dementia are divided into genetic factors and cognitive factors. To prevent dementia by reducing the cognitive factors, the authors of this chapter have developed the coimagination method to activate three cognitive functions that decline at an early stage of mild cognitive impairment (MCI): episodic memory, division of attention, and planning function. The coimagination method supports interactive conversation through expressing feelings about images according to a theme. Allocated time periods and turns for each participant are predetermined so that all participants play the roles of both speaker and listener. Measuring the interactivity of conversation qualitatively and quantitatively has been quite difficult, but conversation interactivity may indicate the intensity of cognitive activities. This paper proposes the conversation interactivity measuring method (CIMM) to measure the intensity of cognitive activities employed during conversation using the coimagination method.

DOI: 10.4018/978-1-60960-559-9.ch043
INTRODUCTION

The causes of dementia are divided into genetic factors and cognitive factors. To prevent dementia by reducing the cognitive factors, intellectual activities (Ball., Berch, & Helmers et al., 2000) and the development of a social network (Frattigioni, Wang, Ericsson, Maytan, & Winblad, 2000; Crooks, Lubben, Petitti, & Chiu, 2008) have been reported to be effective. It is hypothesized that the activation of three cognitive functions that decline in mild cognitive impairment (MCI) is effective for the prevention of dementia (Rentz & Weintraub, 2000; Barberger-Gateau, Fabrigoule, & Rouch et al., 1999). These cognitive functions include episodic memory, division of attention, and planning functions. Interactive communication activates these three functions and intellectual activities and forms the basis of a social network. Reminiscence therapy has been shown to be an effective method for the enhancement of psychological well-being in older adults (Yasuda, Kuwabara, Kuwahara, Abe & Tetsutani, 2009). However, its focus is not on the activation of cognitive functions even though it is based on communication. A novel method known as coimagination has been proposed by the authors of this paper to support interactive communication and activate the three cognitive functions (Otake, Kato, Takagi, & Asama, 2009; Otake, 2009).

To evaluate the intensity of cognitive activities during conversation via the coimagination method, this paper proposes the conversation interactivity measuring method (CIMM).

COIMAGINATION METHOD

The aim of the coimagination method is to support interactive conversation and to activate episodic memory, division of attention, and planning functions, which decline in the early stage of mild cognitive impairment. Figure 1 describes the protocol of the coimagination program, intuitively, for first-time participants. The description of the coimagination method and the cognitive functions that are expected to be activated for each step is given below.

Planning Functions

It is difficult to estimate the internal views or feelings of other people from external observation, but these internal views and feelings are the keys for understanding one another (Figure 1 - 1). To lower such barriers, the coimagination method...
Related Content

A Framework for Privacy Assurance and Ubiquitous Knowledge Discovery in Health 2.0 Data Mashups
Jun Hu and Liam Peyton (2010). *Ubiquitous Health and Medical Informatics: The Ubiquity 2.0 Trend and Beyond* (pp. 64-83).
www.igi-global.com/chapter/framework-privacy-assurance-ubiquitous-knowledge/42928?camid=4v1a

Visual Gnosis and Face Perception
Shozo Tobimatsu (2011). *Early Detection and Rehabilitation Technologies for Dementia: Neuroscience and Biomedical Applications* (pp. 55-64).
www.igi-global.com/chapter/visual-gnosis-face-perception/53421?camid=4v1a

Statistical Analysis of Spectral Entropy Features for the Detection of Alcoholics Based on Electroencephalogram (EEG) Signals
www.igi-global.com/article/statistical-analysis-of-spectral-entropy-features-for-the-detection-of-alcoholics-based-on-electroencephalogram-eeg-signals/86050?camid=4v1a

Convergence of Nanotechnology and Microbiology
www.igi-global.com/chapter/convergence-of-nanotechnology-and-microbiology/186670?camid=4v1a