

Subtle Change Detection and Quantification in Magnetic Resonance Neuroimaging

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Sweden

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Subtle Change Detection and Quantification in Magnetic Resonance Neuroimaging

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4

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Research Abstract

Many brain injuries and diseases can damage brain cells, which can lead to loss of nerve cells and loss of brain volume. Even slight loss of nerve cells can give severe neurological and cognitive symptoms. The increasing resolution in magnetic resonance neuroimaging allows detection and quantification of very small volume changes. Due to the enormous amount of information in a typical MR brain volume scan, interactive tools for computer aided analysis are absolutely essential for subtle change detection. Demonstration, localization and quantification of volume loss are needed in brain injuries (e.g. brain trauma) and in neurodegenerative diseases (e.g. many hereditary neurological diseases and dementia). Interactive tools available

today are not sensitive enough for detection of small general or focal volume loss. We propose a model based approach for change detection and quantification in neuroimaging. Extensive testing and evaluation is crucial in this project since the demands on the method's precision and accuracy, as well as reliability are very high. The successful outcome of this project will allow early diagnosis, detailed correct diagnosis, and accurate and precise analysis of treatment response of mild traumatic brain injury, neurodegenerative diseases including dementia, intracranial aneurysms and brain tumors.

Further information available at:

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