

Seminar

Programa de Engenharia Biomédica – PEB-COPPE/UFRJ

Sala/Room H-330

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Introduction to Magnetic Resonance Imaging with Applications to Dementia

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ABSTRACT

The talk will be in two parts. A general introduction to magnetic resonance imaging (MRI) will be followed by a description of my current work at The Mind Research Network. MRI is an accepted modality of body imaging in medicine. The technology is more than 50 years old now. MRI is fascinating because the same piece of hardware can with different appropriate software be used to give different image contrasts. This contrast can be based on differences of structural, chemical, functional, flow and motion properties. I will describe some of my work with diffusion MRI. My current interests are in developing MRI biomarkers for Alzheimer's and vascular dementia. We have developed a trichotomy clustering method based on a) vascular disease biomarkers measured from MRI, b) Alzheimer's disease biomarkers measured from cerebrospinal fluid, and c) cognitive function based on neuropsychological testing to divide subjects into eight groups. This method allows us to identify subjects with mixed dementia, that is those having both Alzheimer's disease and vascular disease factors.

Arvind Caprihan

Dr. Caprihan got his PhD from Rice University (1971) in Electrical Engineering. He taught signal processing at the Program de Engenharia Biomedica, COPPE, UFRJ from 1972 to 1982. In 1982 he moved to The Lovelace Institute at Albuquerque, New Mexico, USA. After initially working on ultrasound, his interest since 1984 has been magnetic resonance imaging (MRI). Since 2002 he has been a research scientist at The Mind Research Network, Albuquerque with a focus on brain imaging. His MRI work has encompassed a) MRI techniques for flow and diffusion, b) Gas MRI imaging, c) MRI in Infants, d) Diffusion Imaging in Mental Illness, and e) MRI in Elderly. At present his primary project is to develop MRI biomarkers for vascular dementia. He holds a US Patent on flow imaging and has more than 130 peer-reviewed publications.