Alzheimer's Electroencephalogram Event Scalp Localization

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Abstract

Alzheimer's disease (AD) is a neurodegenerative and incurable illness that causes intellectual functions decrease. This study is a new approach to improve the scalp brain anomalies localization associated with Electroencephalogram (EEG) energy variations of EEG threads (subsegments) sequencies sets found in AD patients by unsupervised learning techniques, called AD EEG temporal events. This study showed that AD patients have less brain dynamics than controls, because the AD EEG events propagation time over the scalp is higher and statistically different from control subjects ($p < 0.0022$)

Wideband 32-element 200-MHz 2-D IIR Beam Filters using ROACH-2 Virtex-6 sx475t FPGA

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Abstract

Two-dimensional (2-D) IIR beam filter applications operating in ultra wideband (UWB) radio frequency (RF) range requires hardware capable of handling high speed real-time processing due to its operation bandwidth lies in megahertz or gigahertz range. Two-dimensional IIR beam forming is used mainly for applications such as communications, radars and detection of directional sensing . A systolic architecture is proposed for the real-time implementation of the 2-D IIR beam filter. This the first attempt of evaluating the prospect of practical implementation of such a beam filter capable in ROACH-2 hardware platform which is equipped with a Xilinx Virtex-6 sx475t FPGA chip, widely used in the field of radio astronomy reaching upto 200 MHz operating frequency.