

RFcap: A software application for capturing and analyzing the RF signal for Nucleus multichannel cochlear implants

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Being able to visualize and analyze the complex stimuli actually transmitted to a cochlear implant (CI) is very useful for developmental as well as for diagnostic purposes. This requires being able to receive and decode the radio frequency (RF) coded signals, which would involve appropriate hardware, and then processing the decoded data using appropriate software. The Nucleus Implant Communicator and Nucleus Matlab Toolbox research software libraries from Cochlear, together with the current IF6-PCI clinical hardware for the Nucleus CI system, provides such functionality. RFcap is a Matlab application that encapsulates the necessary functions to capture, visualize and analyze the RF coded signals intended for the Nucleus CI24x multichannel cochlear implants. The captured signals are stored as pulse sequences, and are visualized in the form of electrograms. Various statistical analyses can then be performed on the stored data. One very useful feature of RFcap is the ability to compare two captured signals, which also then allows RFcap to be used for diagnostic purposes. The RFcap system will be presented, with an overview of the analysis features available. Various examples will also be presented to demonstrate how it has been used for investigating speech coding strategy developments as well as for diagnosing speech processor problems. In short, RFcap is useful both for designing and verifying new speech coding strategies, as well as for diagnosing problems with the external equipment of the cochlear implant systems.

