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(54) METHOD, APPARATUS AND SYSTEM FOR NEURAL NETWORK HEARING AID

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(57) **ABSTRACT**

The disclosure generally relates to a method, system and apparatus to improve a user's understanding of speech in real-time conversations by processing the audio through a neural network contained in a hearing device. The hearing device may be a headphone or hearing aid. In one embodiment, the disclosure relates to an apparatus to enhance incoming audio signal. The apparatus includes a controller to receive an incoming signal and provide a controller output signal; a neural network engine (NNE) circuitry in communication with the controller, the NNE circuitry activatable by the controller, the NNE circuitry configured to generate an NNE output signal from the controller output signal; and a digital signal processing (DSP) circuitry to receive one or more of controller output signal or the NNE circuitry output signal to thereby generate a processed signal; wherein the controller determines a processing path of the controller output signal through one of the DSP or the NNE circuitries as a function of one or more of predefined parameters, incoming signal characteristics and NNE circuitry feedback.