TITOLO PROGETTO

DUAL-PRO - Dual electric-acoustic speech processor with linguistic assessment tools for deaf individuals with residual low frequency hearing
Linea finanziamento: VII FP - Capacities - research for SMEs
Area Scientifico Disciplinare: 11_ Scienze storiche, filosofiche, pedagogiche e psicologiche

STRUTTURA (Dipartimento/Centro)
Dipartimento di Scienze del Linguaggio

DOCENTE RESPONSABILE SCIENTIFICO
CARDINALETTI Anna

DATI FINANZIARI

Costo Complessivo del Progetto	Finanziamento Complessivo Assegnato	Costo totale delle attività a Ca' Foscari	Assegnazione Complessiva a Ca' Foscari
1.196.454	892.880	96.485	96.485

INIZIO ATTIVITA' (previsione)
2008

FINE ATTIVITA' (previsione)
2010

ABSTRACT PROGETTO

Scientific and technological background.To date, individuals with sensori-neural hearing loss may benefit from either acoustic stimulation (classical hearing aids) or electric stimulation (cochlear implants). Classical hearing aids are best suited for moderate and severe hearing losses and cochlear implants for profound losses. Cochlear implants enable profoundly deaf patients to reach high levels of speech intelligibility, but they are inadequate for the perception of music. The reason for this is that implants are conceived to code for the mid and high frequencies of sound ("spectral coding") since speech information is mainly contained in these frequencies. Implants are not performing well in the coding of low frequencies ("temporal coding"). These frequencies contain mainly information related to tonality, musicality, timbre, etc. Hearing aids perform much better in the temporal coding of low frequencies. Since most profoundly deaf persons have profound losses in the mid and high frequencies while they often have residual hearing in the low frequencies, the combination of the spectral coding of a cochlear implant with the temporal coding of a hearing aid, seems promising in improving the auditory performance of implant-wearers. In addition, temporal information seems of specific importance for the linguistic development in young children and it is anticipated that improving the low frequency perception may significantly enhance their linguistic capacities, thus decreasing their handicap and increasing the probability of mainstream integration.
Main objectives of the proposed project: (i) to optimise deaf patients' hearing experience by developing a new hearing device which combines both types of stimulation in the same ear; (ii) to develop a test battery for prosody reception, i.e. the perception of language rhythm and melody; and (iii) to use this new prosody test battery as a quality measure for the current generation of cochlear implants and classical hearing aids, as well as for the newly developed hybrid electric-acoustic prototype.
Beneficiaries. The primary beneficiaries of the proposed project are the 3 participating SMEs. The innovative character of the project, in combination with its multilingual setting will put them at the word class level of both current hearing device technology as well as speech and language assessment tools. The endusers are a vast group of deaf cochlear implant users for which the simultaneous use of hearing aid and

cochlear implant speech technology is expected to provide important improvements in both speech and music perception. As such, this new hearing technology is also adapted to the needs of deaf individuals that have been excluded as potential implant candidates until recently. In particular, such candidates are young deaf infants, for which the development of spoken language is largely dependent on the perception of prosodic cues in the speech signal. Other important new beneficiaries are patients with significant residual hearing in the low frequencies but with unsatisfactory results in speech understanding due to little to no hearing at higher frequencies.