APPLICATIONS OF ASR FOR PEOPLE WITH HEARING LOSS

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And
Advanced Hearing Concepts
DIFFERENT NEEDS FOR DIFFERENT GROUPS

• Hard of Hearing: Improved Hearing Aids

• Profoundly Deaf: Speech Transcription
  Sign Language

• Deaf-Blind: Tactual Aids
RESEARCH PHILOSOPHY

• Explore capabilities of emerging technologies for people with hearing loss
  Initially without regard to practical constraints

• Once an idealized technique has been evaluated with positive results, find a practical approximation to the ideal
COMPUTER ASSISTED REMOTE TRANSCRIPTION (CART) AS A RESEARCH TOOL

Explore potential applications of ASR using CART

If positive results obtained, develop practical version using ASR
CART IN THE CLASSROOM

• Used at NTID, Gallaudet University
• Evaluations are positive, but cost is high
• ASR would be cost effective

• Error rate is a problem and varies with the complexity of the transcription
MOBILE PHONES + CART IN THE WORKPLACE

• Very useful for instructing deaf employees
• Invaluable at group meetings, conferences
• Hotel experiment showed greater efficiency and increased earnings for deaf workers
• CART not cost-effective in this application
• Great potential for mobile phones + ASR
• Background noise & drop-outs a problem
MOBILE PHONES + CART IN EVERYDAY LIFE

• Shopping
• Getting directions
• Using public transit
• Emergency services

Problems:

Time consuming explanations often needed
Background noise, drop-outs

Difficulty with public address systems

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Prediction is very difficult especially when it involves the future (Chinese proverb)
UNEXPECTED PROBLEMS WITH DEAF STUDENTS

• Students skipped classes
  Borrowed transcribed lectures from friends

• Faculty not happy with unedited lecture notes being circulated

• Simplifying transcribed text controversial

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UNEXPECTED PROBLEMS WITH HARD-OF-HEARING

- Digital wireless devices (DWD) generate interference in hearing aids
- Pressure from FCC resulted in development of ANSI standard setting limits on interference generated by DWDs
- Hard-of-hearing more sensitive to distortions in wireless transmissions
INNOVATIVE APPLICATIONS OF ASR

TEACHING SPEECH TO DEAF CHILDREN AND ESL STUDENTS

• ASR can identify nature of speech problem
• Recognize errors in speech production
• Synthesize corrected speech
• ASR errors can reinforce poor speech
• Recognition and synthesis of deaf speech a powerful research tool

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Experiments with CART have identified several very useful applications of ASR. These include:

• Classroom applications
• Speech training
• Improved speech understanding in noise
SUMMARY (continued)

• Mobile phones + ASR for deaf workers enable greater efficiency and increased earnings

• Mobile phones with ASR for shopping and social interactions improves quality of life

• Mobile phones with ASR in emergency situations can be extremely valuable
THANKS FOR LISTENING

YOU CAN WAKE UP NOW