A FRAMEWORK FOR SPEECHREADING ACQUISITION TOOLS

PROBLEM & MOTIVATION

360

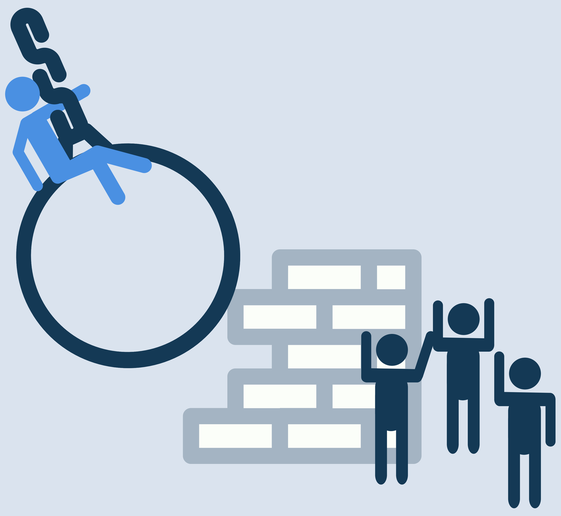
Million People across the World have disabling hearing loss

(~5% World's Population)

Barriers to communication due to a hearing loss may result in a stagnant career, social isolation and a decrease in overall life satisfaction.

People with a hearing loss find that speechreading can overcome barriers when communicating with others and improve conversational understanding.

However, speechreading is a difficult skill to learn and acquire.



Speechreading can break barriers and improve understanding

FRAMEWORK

We interviewed **7 speechreading tutors** to see how acquisition could be improved by designing new technology.

From thematic analysis of the interview data, we developed a framework that can help design **Speechreading Acquisiton Tools.**

Skill Type

Amount of Information	ANALYTIC	HYBRID	SYNTHETIC
HIGH			
MED			
LOW			

EVALUATION

1. We categorised every identified teaching technique mentioned by tutors in our interviews.

Skill Type

Amount of Information	ANALYTIC	HYBRID	SYNTHETIC
HIGH	Mirror Practice QREs	Word Quizzes (name the animals)	Framed Sentence Exercises
MED	Finger Spelling (initial letter)	Cue Recognition (body language)	Scenarios
LOW	Speech Movements Lip Shapes	Pair Work	Mystery Object Stories

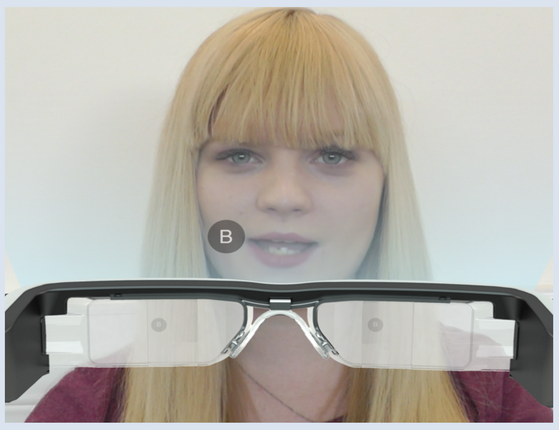
2. We critically evaluated and categorised existing conversation aids and previously designed SATs.

Skill Type

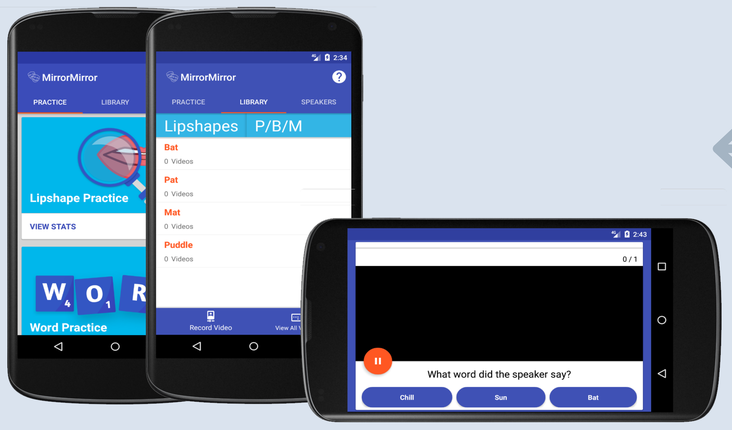
Amount of Information	ANALYTIC	HYBRID	SYNTHETIC
HIGH	Cued Speech, Spectrograms	Subtitles, Signed Languages	ContextCueView
MED	PhonemeViz	LipreadingPractice	CME (C)
LOW	Upton, Ebrahimi TactileSATs, CME(A) Lip Assistant, iBaldi	MirrorMirror	CME (B) DAVID

3. We designed three new tools using the framework:

PhonemeViz is a visualisation that places the characters of the most recently spoken phoneme (speech sound) to the side of a speaker's lips. PhonemeViz could be overlaid onto videos or on a head mounted display to augment speechreading.



Mockup of PhonemeViz on Epson Moverio Glasses



MirrorMirror, showing lipshape library and practice mode

MirrorMirror is an android app that allows speechreaders to capture and store videos of speech movements and words in a "lipshape library".

ContextCueView gathers contextual data (e.g., GPS, time) to anticipate a user's situation.
Using this contextual data the app loads an association diagram which can help speechreaders anticipate words and phrases.

Mockup of ContextCueView on Google Glass

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