Interactive Text-to-Audio Dyslexia Reading Tool
Annett Gawerc, Smiti Narayanan, Angie Varela
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Introduction
Dyslexia is an impairment of reading and comprehension and is the most common learning disability, affecting 17% of American children\(^1\). Diagnosis commonly occurs in the early years of elementary school as students transition from learning to read to reading for comprehension. As there is no cure or medication for dyslexia, there is a need for engaging, interactive, and cost effective dyslexia aids for younger children to facilitate the transition.

Need Statement
A way to increase the ease and speed of text comprehension by translating any printed text to audio

Need Specifications
Target Consumer- 1st through 3rd graders with dyslexia that hinders their speed and comprehension while reading

<table>
<thead>
<tr>
<th>Needs</th>
<th>Measurement</th>
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<tbody>
<tr>
<td>Faster reading rate</td>
<td>200 words per minute</td>
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<tr>
<td>Lightweight</td>
<td>2.5 lbs</td>
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<tr>
<td>Comfortable to use</td>
<td>At least 4 on a 1 to 5 scale</td>
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<tr>
<td>Affordable</td>
<td>&lt; $200</td>
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Competitor Analysis
ChromaGen\(^\circledR\) Lenses\(^2\)
- Technology is not scientifically proven to work
- Not supported by optometrists
- Expensive ($1000)

Reading Pen\(^3\)
- Hard to keep track of lines
- No special features designed for dyslexia

Concept Analysis

Touch Book
- Interactive: Student highlights the text by running their finger over the screen
- Increases independence: Gradually phases out words when students have read them numerous times
- Keeps students engaged: Changes the font of the screen or background

Figure 1: Block diagram of device

Figure 2: Visual model of current design

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References
[1] http://repository.cmu.edu/cgi/viewcontent.cgi?article=2088&context=psychology

Conclusions
On average, the software accurately translated 94% of the words. Future improvements may include modifying the software to gradually phase out words and include more interactive features, as well as integrating all the components into one comprehensive device.