

Making math-to-Braille transcription more convenient for teachers of the visually impaired

For educators of the visually impaired...

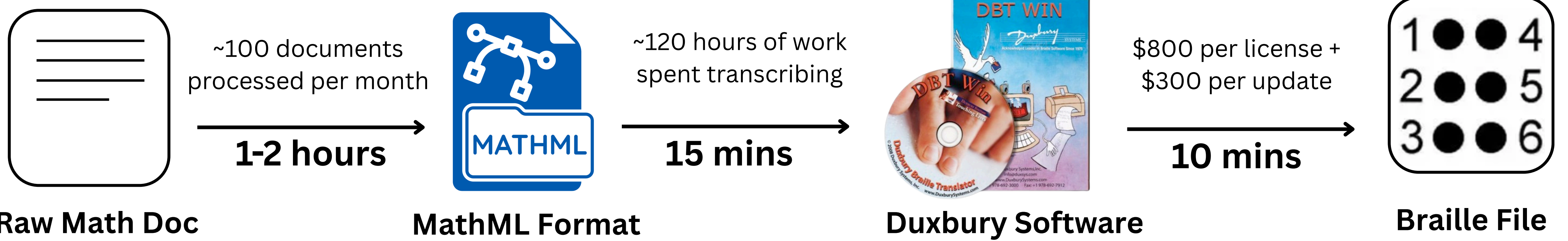
- Transcribing math documents to braille formats is **tedious & time-consuming**
- Currently requires chaining together **3-4 expensive, disconnected tools**

92% of blind students in Georgia don't go to specialized schools

5% of blind students score proficient in math

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AB	
$\triangle ABC$	
$\angle ABC$	
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$m\angle ABC$	

Nemeth Braille translation



Raw Math Doc

MathML Format

Duxbury Software

Braille File

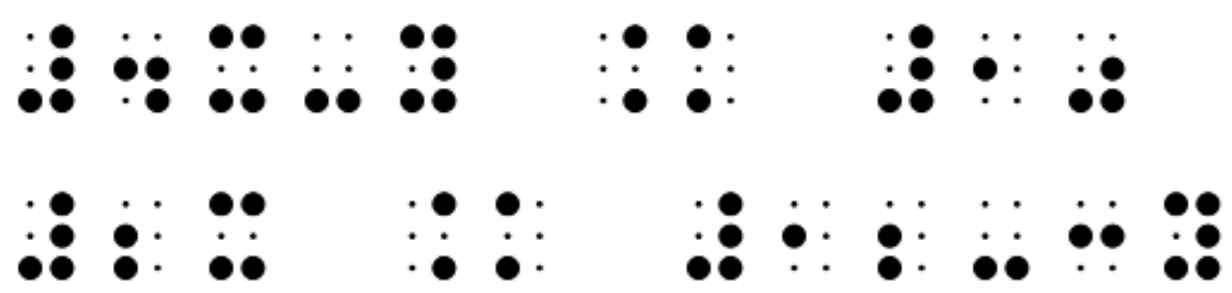
NEMETH NIGHTMARE The flow chart above depicts the tedious transcription process that teachers go through to turn raw math documents into Braille-ready formats. Existing tools are expensive, outdated, and only handle one piece of the process.

Inputs: .pdf, .docx, .tex, or written flexible design with multiple parsers that can handle various file formats

$$4x - y = 10$$

$$2x = 12 - 3y$$

Output: .brf file with Braille can be embossed by Braille printers or displayed on electronic readers



Our Solution

Transform math to Braille in one click:

Take a document, press a button, receive Braille-ready file



ORIGINAL CONTENT

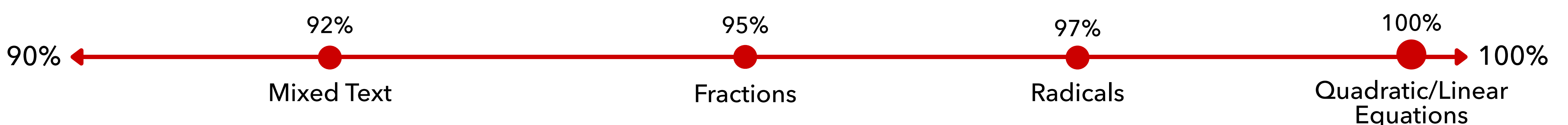
$$11 * \frac{x+2}{x^2} + 9x + 18 = \frac{x+2}{(x+3)(x+6)}$$

BRILLE OUTPUT

By using TactiMath, teachers...

- Reduce Braille transcription times from **15 minutes to 15 seconds**
- No longer require hours of training, create math resources for students quickly & accurately
- **Unique value:** low-cost, unified "one-click" process, versatile input formats

Transcription Accuracy (% correct characters)



Future Steps

- Support complex visuals like graphs & charts
- Pilot prototype with teachers for visually impaired & gather feedback
- Implement in actual classrooms & routines

Experiment Results

- **95% avg. accuracy** across 10 documents
 - Linear/quadratic equations, fractions, square roots, mixed text
- Hours of manual work → **minutes.**