



THE AUTOMATED BRAILLE WRITING TUTOR

Using Computing Technology to Enhance Braille Education
for the Visually-Impaired in Developing Communities

TECHBRIDGEWORLD

- ⊙ Research group at Carnegie Mellon University
- ⊙ Technology with a Global Heart
- ⊙ Work primarily with underserved communities
- ⊙ Founded in 2004 by Dr. M. Bernardine Dias
- ⊙ Numerous projects in education and assistive technology
- ⊙ www.TechBridgeWorld.org



Carnegie Mellon



Motivation | Design | Demonstration | Continuing Work



MOTIVATION

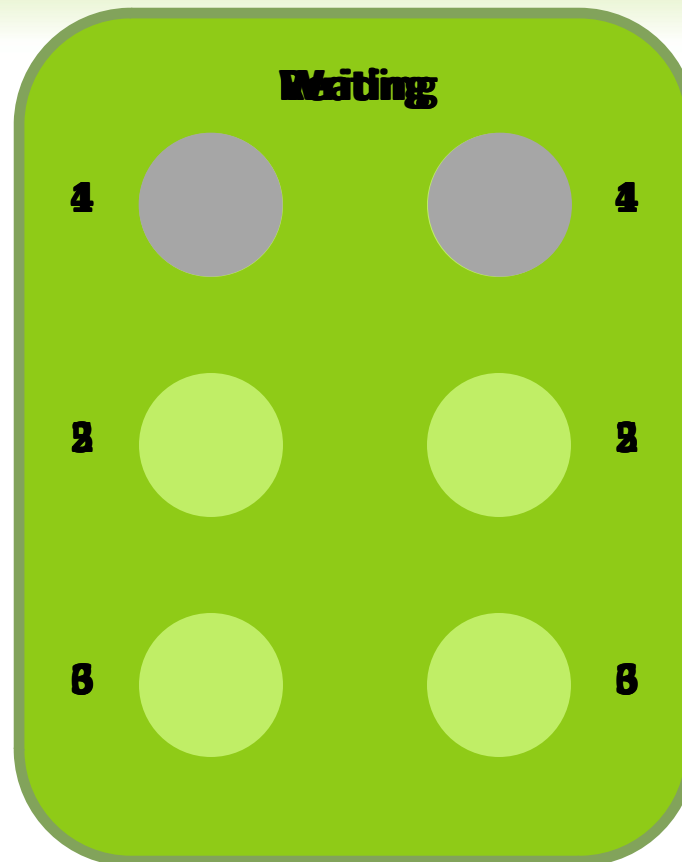
- ③ 87% of the world's 314 million blind and visually-impaired live in developing communities¹
- ③ Literacy rate is estimated to be under 3%²



¹ <http://www.who.int/mediacentre/factsheets/fs282/en/index.html>

² E. Helander, *Prejudice and dignity: an introduction to community-based rehabilitation*. New York: UNDP, 1998.

BRaille CELL



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BRAILLE WRITING

- ⦿ In developing communities, braille is almost always written with a slate and stylus
- ⦿ Challenges include:
 - ⦿ Delayed feedback
 - ⦿ Specialized braille paper may be expensive or limited in supply



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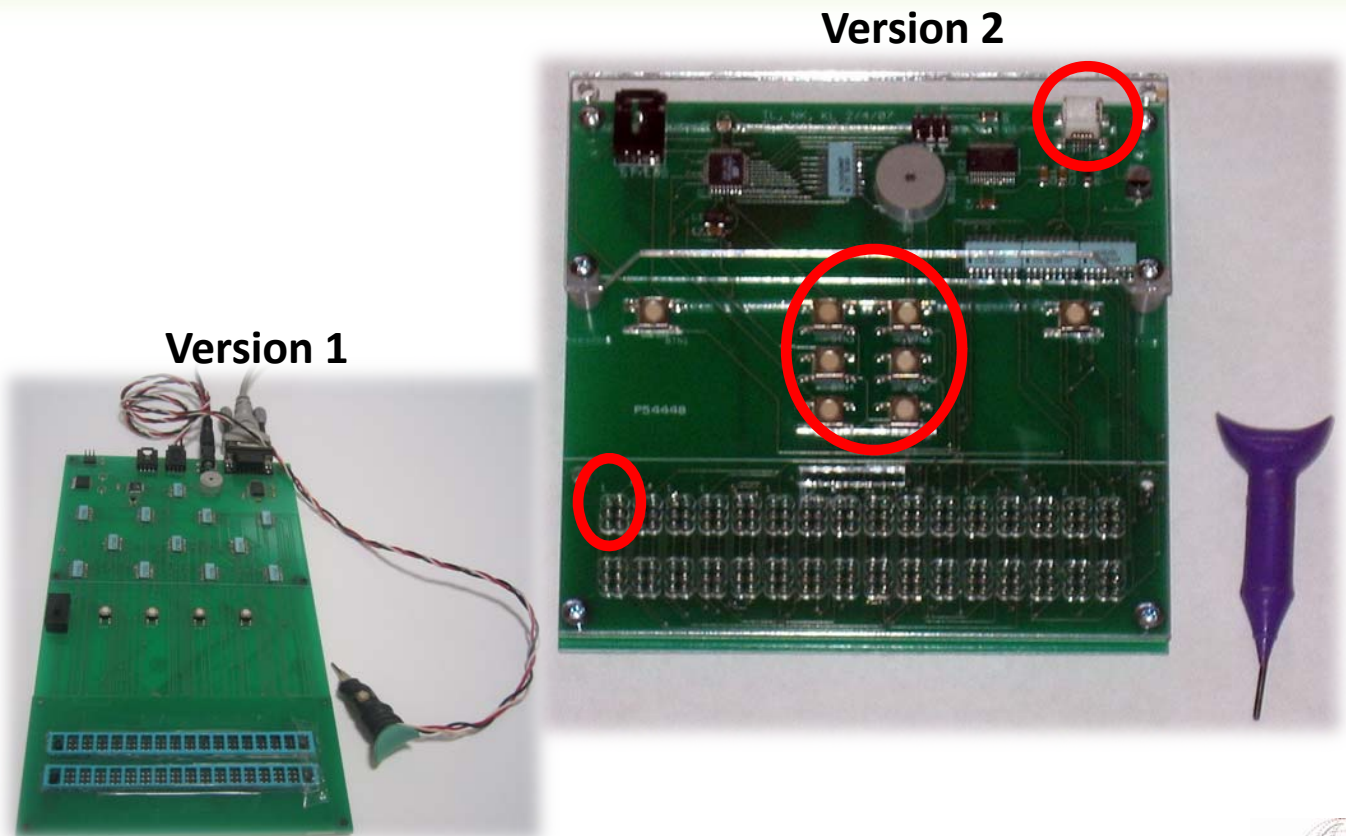
BRAILLE WRITING TUTOR

- ⦿ Started out as 2 independent study projects by 2 Robotics Ph.D. students
- ⦿ Partnered with the Mathru School for the Blind near Bangalore, India
- ⦿ Low-cost and educational assistive technology device
 - ⦿ Teaches braille writing
 - ⦿ Immediate audio feedback
 - ⦿ Guides writing and corrects mistakes



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DESIGN



Motivation | **Design** | Demonstration | Continuing Work

DEMONSTRATION



Motivation | Design | **Demonstration** | Continuing Work

GLOBAL PARTNERS

BANGLADESH

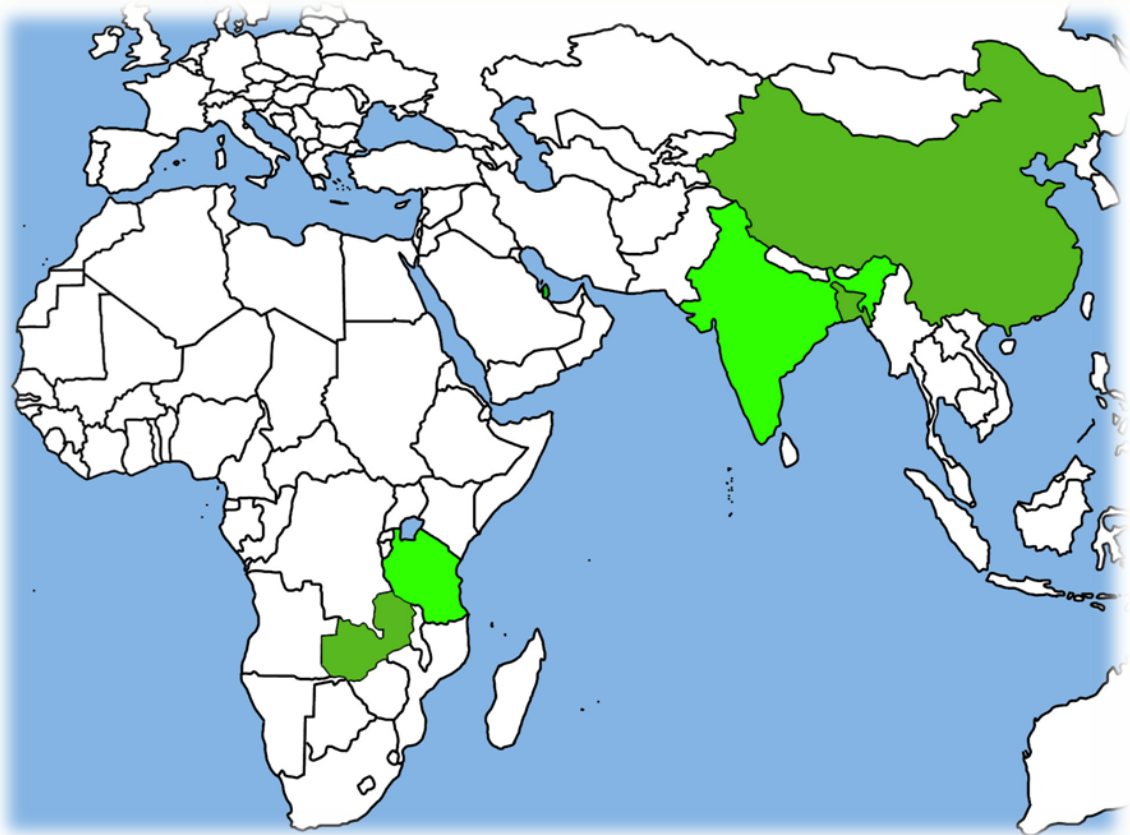
CHINA

INDIA

QATAR

TANZANIA

ZAMBIA



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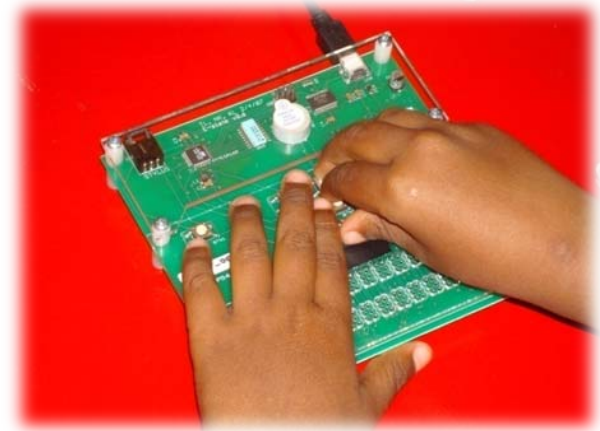


CUSTOMIZATION

- ◎ Language options
 - ◎ English, Arabic, Chinese, French, and Swahili braille
- ◎ Game activities
 - ◎ Animal Sounds, Hangman, MusicMaker, Dominoes
- ◎ Instructional voices
 - ◎ Local contacts with local accents
- ◎ Some hardware modifications on site also possible

FUTURE

- ⊙ Protective and child-friendly casing
- ⊙ Cost reduction
 - ⊙ \$135 per unit at production quantities of 10
 - ⊙ Less than \$100 per unit at higher production level
- ⊙ Stand-alone version
 - ⊙ Battery-operated
 - ⊙ On-board computing
- ⊙ Expansion of field tests
 - ⊙ Longer-term testing
 - ⊙ Additional partners





THANK YOU!

