

# A graphical tactile display for the visually impaired

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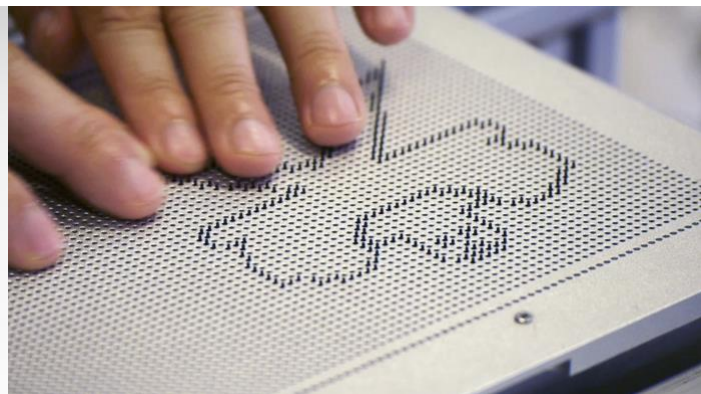
According to WHO latest statistics in 2017, there are approximately 253 million people suffering visually impaired in the world, including 36 million totally blind individuals, 90% of which living in developing countries. It is known that the blind people are able to learn and understand texts by Braille, such as Braille books, or make use of voice-assisted software such as screen reader to surf the Internet by voice, but there is very limited tool to help the blind people learn and understand graphical information.

Current large pin-matrix graphical displays employ thousands of piezoelectric actuators, which are very expensive, and hinder popularization. We design and implement a new type of graphical tactile display: Graille. This 60 by 120 pin-matrix device is made up of economical push-push structure actuated by a customized electromagnet matrix, achieving the significantly lower cost than other tactile displays. Meanwhile, Graille has a touch guidance interface. This interactive interface aims to enhance the usability of tactile graphics and dynamic tactile displays by introducing both haptic and audio experience.

The innovative device is able to achieve good haptic perception experience and a relative cost balance. It can render rich graphical tactile images as well as Braille, which can be widely used as educational resources in schools, public places and blind families. We hope our product-quality tactile graphical display can open new perspectives for the visually impaired people.



Graille



pin-matrix of Graille