


Glide: A Portable Braille Converter Using Mechanical Miniature Pistons

Gaurav Nyaupane 
Tribhuvan University
gaurav.74742@memc.tu.edu.np

February 2022

Abstract

Glide is a compact, handheld assistive device aimed at empowering visually impaired individuals to read standard printed text through real-time Braille conversion. Roughly the size of a traditional eraser, Glide is designed to be manually glided over the lines of printed material. It uses a miniature camera to capture the text beneath it and processes the image using Optical Character Recognition (OCR) via OpenCV. The recognized characters are then dynamically translated into Braille patterns. To convey these patterns, the device employs an array of precisely engineered mechanical miniature pistons on its top surface. Each piston acts as a single Braille dot, rising and retracting in real time to form the corresponding tactile configuration. This approach ensures accurate, refreshable Braille feedback as the user moves across the page. The system is controlled by a microcontroller, optimizing performance while maintaining portability.

Notice

This document is intended to demonstrate **conceptual maturity, initiative, and engineering depth**. It **does not necessarily represent final or production-ready product**. It may be **work-in-progress, experimental, or resource-dependent**.

All designs, descriptions, and ideas contained in this document are the **intellectual property (IP) of Gaurav Nyaupane**, unless explicitly stated otherwise. The reader acknowledges the following terms regarding the use of this document:

- No part of this document may be reproduced, stored, shared, or transmitted in any form or by any means — **electronic, mechanical, photocopying, recording, or otherwise** — without **prior written consent**.
- Unauthorized use, replication, reproduction, or adaptation of any content herein, whether in part or in whole, is a direct violation of **copyright and intellectual property laws** and may result in **legal consequences**.
- The reader acknowledges that this document may include **original project ideas and concepts** that are not yet implemented or publicly released. Any attempt to **replicate, monetize, or repackage these ideas without written permission** shall be regarded as **intellectual theft** and may be pursued legally.
- This document is provided strictly for **informational, academic, evaluative, or collaborative purposes only**.

For licensing inquiries, collaboration opportunities, or permissions, please contact:
www.gauravnyaupane.com.np