



# **MindShelf – AI Powered Book Discovery App**

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## **Abstract**

This project aims to develop an AI-powered mobile application that helps readers discover books matching their preferences by scanning physical bookshelves. Building upon the research presented in "A technique to detect books from library bookshelf image" [1], which demonstrates successful book detection through noise removal, bookshelf row detection, and book extraction algorithms, our system extends this foundation by integrating personalized recommendation capabilities. Traditional book discovery methods are time-consuming and often lead to choice overload in bookstores. The proposed system enhances existing book detection techniques with OCR technology for spine text recognition and intelligent matching algorithms to provide instant, relevant book suggestions. The project's objectives include developing a user-friendly mobile interface, implementing advanced book detection based on published research, and creating a preference-based recommendation system. Expected outcomes include reduced decision fatigue for readers, improved book discovery efficiency, and validation of enhanced book detection methodology in real-world environments.

## **Introduction**

Book discovery remains a significant challenge for readers in physical bookstores due to overwhelming choices and lack of personalized guidance. Existing book recommendation systems primarily focus on online platforms and lack integration with physical bookstore environments. Recent research in book detection from shelf images [1] provides a solid foundation for addressing the technical challenges of book identification. This project builds upon established computer vision techniques to create a practical solution for real-world book discovery, leveraging advancements in mobile technology and machine learning.

## **Problem Statement**

Current book discovery methods in physical stores rely on manual browsing, staff recommendations, or generic bestseller lists, which are inefficient and not personalized. Online recommendation engines cannot be applied to physical bookstore environments. While existing research [1] has demonstrated successful book detection from shelf images, there remains a gap in integrating this technology with personalized recommendation systems for end-users. There is a need for an intelligent system that can accurately detect books from shelf images and provide personalized recommendations in real-time.

## **Objectives**

- To design and implement a mobile application for AI-powered book discovery.
- To implement enhanced book detection based on established research in shelf image processing [1].
- To develop accurate book spine text recognition using OCR technology.
- To create a personalized recommendation algorithm based on user preferences.

- To integrate with book databases and provide purchase options.
- To generate instant match percentages and book suggestions.

## **Scope of the Project**

In Scope:

- Implementation of book detection module based on published research methodologies [1].
- Development of book spine recognition using OCR.
- Implementation of preference-based matching algorithm.
- Mobile application development for iOS and Android platforms.
- Integration with book databases and affiliate systems.

Out of Scope:

- Physical hardware development or deployment.
- Inventory management for bookstores.
- Social media platform integration.
- E-commerce transaction processing.

## **Proposed Solution / Methodology**

The proposed solution builds upon established book detection techniques [1] and extends them into a comprehensive mobile application. The system will implement noise removal, edge detection, and book segmentation methods as demonstrated in existing research, then enhance this foundation with spine text recognition and personalized recommendations. The project will use the following tools:

- Frontend: Flutter
- Backend: Node.js with Express.js framework
- Database: PostgreSQL with Redis caching
- Computer Vision: Google Cloud Vision API with custom book detection algorithms
- Book Data: Google Books API, Open Library API

## **Stakeholders**

- Primary Stakeholders: Book readers, Bookstore customers
- Secondary Stakeholders: Bookstore owners, Publishers, Affiliate partners
- Research Community: Computer vision and AI researchers

## **Expected Outcomes**

- A functional mobile application prototype for AI-powered book discovery.
- Enhanced book detection capability building upon established research [1].
- Effective personalized recommendation system.
- Demonstrated improvement in book discovery efficiency.
- Validation of integrated book detection and recommendation methodology.

## **References**

- [1] M. M. Islam, M. S. Alam, and M. N. Amin, "A technique to detect books from library bookshelf image," in 2013 International Conference on Informatics, Electronics and Vision (ICIEV), 2013, pp. 1-6.
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- [3] J. Redmon et al., "You only look once: Unified, real-time object detection," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2016, pp. 779–788.