INFORMATICS INSTITUTE OF TECHNOLOGY

EduGuide Sri Lanka

A Personalized A/L Stream Recommendation and University Guidance Chatbot

The Final Year Project
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Agenda

- Problem Background
- Research Gap
- Research Aim
- System Design
- Technology Stack
- Demonstration
- Significance & Novelty
- Contribution
- Testing & Evaluation
- Limitations & Future Enhancements
- Conclusion

Problem Background

- **Students often select A/L streams based on peer or parental pressure, not personal strengths** *(Adithya, 2024)*
- **Education system is exam-focused, lacking personalized guidance** *(Development, Education and Learning in Sri Lanka, n.d.)*
- **Leading to high failure rates and career mismatches** *(Adithya, 2024; Fong & Biuk-Aghai, 2009)*
- **Rural area with lack of structured counselling** *(Jayasinghe et al., 2021)*

Research Gap

- **Absence of Real-Time, Localized Systems** — Most existing systems are not trained on recent, localized educational datasets, limiting their applicability and accuracy for the specific needs of Sri Lankan students *(Munasinghe et al,. 2025)*.
- **Limited Use of Ensemble Learning Techniques** — Ensemble models, which combine the strengths of multiple algorithms to improve prediction robustness and accuracy, are rarely applied in current educational recommendation systems, creating a gap for more advanced predictive solutions *(Arjay et al., 2023)*.
- **Lack of Semantic Search and Skill-Based Personalization** — Current university guidance platforms underutilize semantic search and skill-matching techniques powered by NLP, reducing the relevance and personalization of recommendations for students.

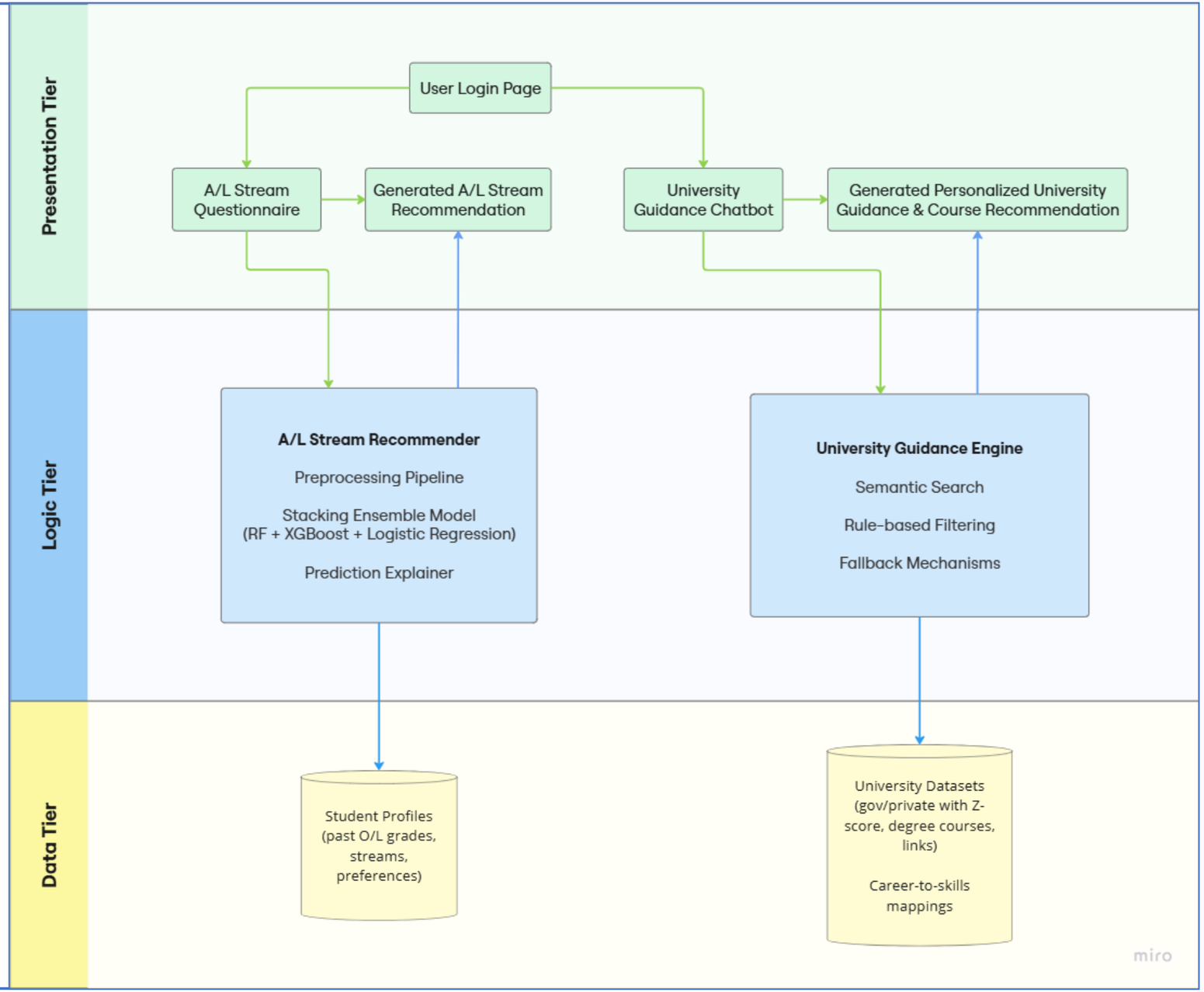
Research Aim

The **Aim** of this study,

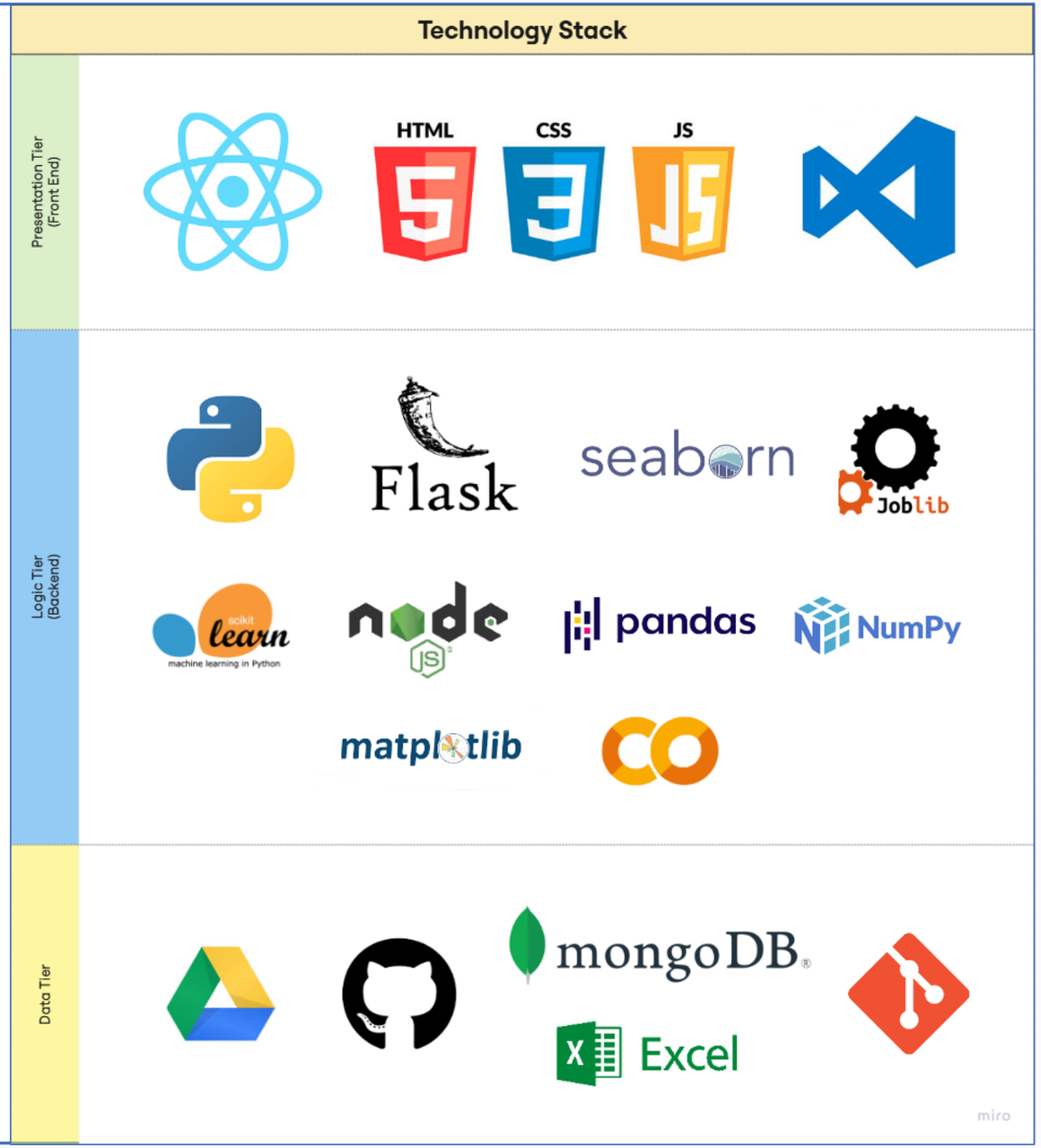
- *To design, develop, and evaluate a portal that assists Sri Lankan students in selecting the **most suitable A/L streams** and **universities** based on their interests, academic strengths, and career aspirations.*

System Design

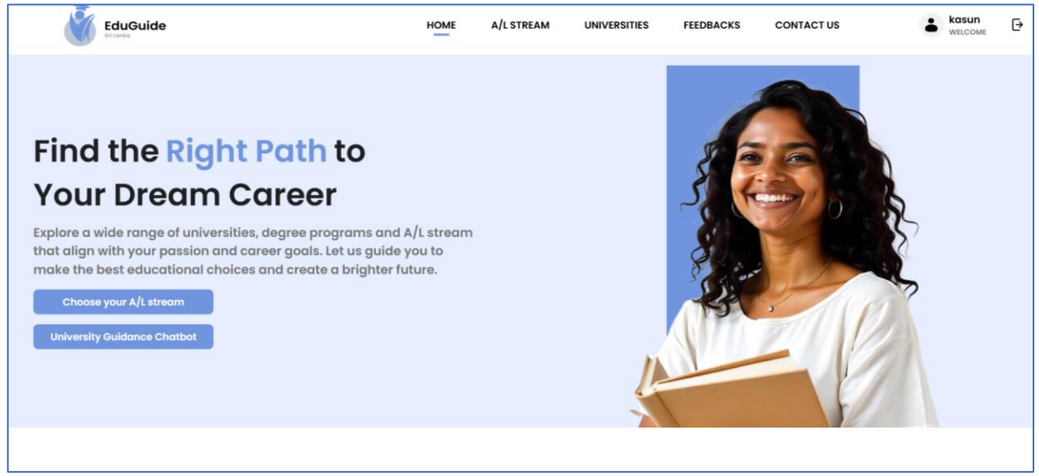
(Architecture Diagram)



Implementation
(Technology Stack)



EduGuide Demonstration



Significance & Novelty

- Provides a **localized solution** specially designed for Sri Lankan students, recommending both A/L streams and university programs.
- Trained on **real, survey-based data** collected directly from Sri Lankan school students.
- Features a **chatbot interface** for interactive, natural language guidance, offering a more personalized and user-friendly experience.

Contribution to the Body of Knowledge

- Developed a guidance system tailored to the **Sri Lankan education system**, addressing both A/L stream selection and university recommendation.
- Applied an **ensemble learning model** for educational recommendations, a technique rarely used in existing local platforms.
- Created and published three original datasets:
  - **A/L student survey dataset**
  - **Z-score cutoff dataset** (collected from official Ministry of Education data)
  - **Private university course dataset** (compiled from institutional websites)

Testing & Evaluation

A/L Stream Recommendation Model

- Model Used: Stacking ensemble combining Random Forest, XGBoost, and Logistic Regression
- Test Accuracy: 78%

University Guidance Chatbot

- Core Technique: Semantic Search with Sentence-BERT
- Cosine Similarity Threshold: Ideal value ≥ 0.7

Limitations & Future Enhancements

Limitations of the Research

- Small dataset size
- Limited demographic diversity among survey respondents
- Limited real-world testing and validation

Future Enhancements

- Expand the dataset
- Multilingual & accessibility support
- Explainable AI (XAI)
- Institutional collaboration

Conclusion

Summary

- Developed a unified platform for A/L stream selection and university guidance.
- Combined ML, semantic search, and local data to personalize student advice.

Impact

- Supporting Sri Lankan students in making smarter, more informed academic and career decisions.

Final Note

- Future improvements will focus on building scalable, explainable, and inclusive AI-driven educational tools.

Thank You…

“Let’s transform Sri Lankan education, one student at a time!"