PaperPal: An AI-Powered Platform for Collaborative Reading and Discussion

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Problem & Motivation

- Collaborative research paper reading is often **fragmented across tools**, and they are not designed for group learning.

- Researchers often struggle and find it really **hard to stay synchronized** during group reading sessions.

- Current AI tools lack integration and contextual awareness, which is needed for effective academic collaboration.
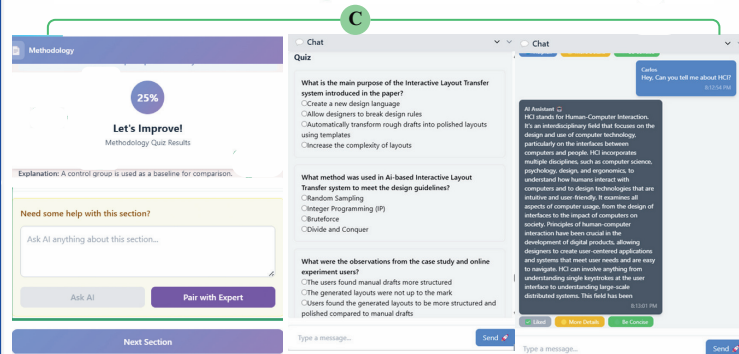
Objectives

- **Fascilitate collaborative research paper reading** using annotation, AI-powered summarization, and discussion tools.

- **Enhance group understanding and engagement** through context-aware AI support and real-time interaction.
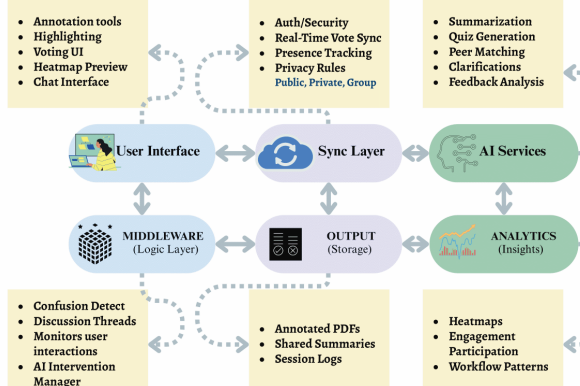
How It Works?

- **Upload & Sync**
  - Teams upload papers to a shared workspace
  - Live collaboration: **See others' edits instantly**
- **Annotate Together**
  - Highlight and comment simultaneously
  - Color-coded by user with **threaded discussions**
- **AI-Powered Insights**
  - Smart Help: Answers questions using the paper's content
- **Peer Support**
  - Pair users for help based on:
    - Expertise
    - Current reading progress

What is PaperPal?

An all-in-one platform combining real-time annotation, AI summaries, quizzes, and chat to streamline group paper reading.

System Architecture

Features

- **(A) Tunable AI Summaries**
  - Easily **switch between short summaries and detailed explanations**, while AI highlights the main ideas, key contributions, and methods of the paper

- **Smart Help from AI or the Right Peer**
  - Receive instant AI support through on-the-spot clarifications and **smart help suggestions when the system detects you're facing difficulties**
  - Collaborate with peers who have expertise in the topic, encouraging peer-led learning alongside AI assistance

- **(B) Intelligent Annotation Insights**
  - **AI helps analyze your annotations** in real time to highlight important patterns, main ideas, and group contributions.

- **(C) Intelligent Support**
  - Get clear, personalized explanations when needed, and use **AI-generated quizzes** to strengthen understanding and recall of key concepts
  - The system detects when you're struggling and suggests personalized support
  - **Connect with knowledgeable peers** for collaborative learning, diverse perspectives, and active peer teaching alongside AI guidance
  - **Combines real-time AI responses with rich peer interaction** for a holistic learning experience
  - AI and peers respond instantly to your questions, keeping study sessions interactive and engaging

Conclusion

- PaperPal promotes deeper understanding and inclusive collaboration in academic reading groups.

- Our system enhances research discussions by integrating AI-driven insights and group dynamics in one platform.

- By aligning individual insights and group dynamics, it transforms how research is read, discussed, and learned.