Campus Connect : AI-Powered Community Platform

Mohammed Nihal, Samarth, Anis Hasan, Manvith B M and Ms. Soumya Kulal
Department of Computer Science and Engineering
(Artificial Intelligence and Machine Learning)
Sahyadri College of Engineering & Management Mangaluru

Abstract

Campus Connect is an AI-driven student community platform focused on secure, intelligent, and personalized interactions.
Its standout feature is a webcam-based Human Verification System that performs a real-time liveness check during login/sign-up to prevent bots and spam, ensuring privacy by not storing images or identifying users.
The platform also includes a locally trained chatbot, an AI-powered post summarizer, and a community recommender that learns interests through simulated preference modeling, creating a safe and engaging environment.

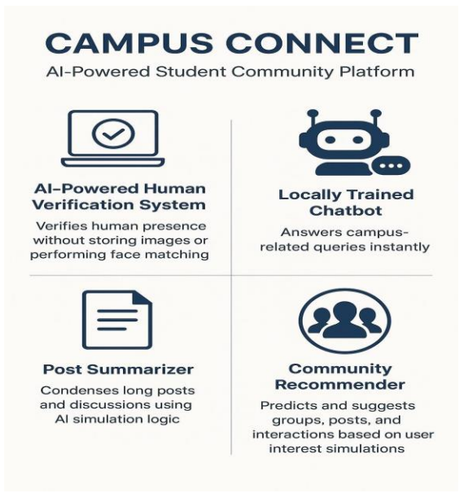
Introduction

Student community platforms often struggle with security, engagement, and content overload. Bots and automated accounts can disrupt the user experience, while a lack of personalization makes discussions scattered and unorganized. Campus Connect aims to solve these issues by combining AI-driven safety, smart personalization, and real-time assistance.

The central innovation is the AI-powered Human Verification System that uses the webcam to verify human presence without storing images or performing face matching. This prevents automated sign-ups and spam, ensuring that every account belongs to a genuine student.

Alongside this, the platform integrates three additional AI modules:

1. A locally trained chatbot capable of answering campus-related queries instantly.
2. A post summarizer that condenses long posts and discussions using AI simulation logic.
3. A community recommender that predicts and suggests groups, posts, and interactions based on user interest simulations.



Problem Statement and Objectives

Problem Statement:
Community platforms frequently face issues such as:
- Automated bot sign-ups
- Spam posts and mass account creation
- Low personalization leading to poor user engagement
- Information overload due to lengthy posts
- Lack of real-time intelligent assistance

Campus Connect requires a unified system that enhances platform safety, relevance, and usability without compromising user privacy.

Objectives:
- O1: Implement a webcam-based human verification model to prevent bots.
- O2: Ensure privacy by avoiding any form of facial recognition or image storage.
- O3: Integrate a locally trained chatbot for campus-related queries.
- O4: Provide AI-generated summaries of long posts using simulation-based logic.
- O5: Recommend relevant communities using user interest modeling and AI simulations.
- O6: Improve overall security, engagement, and content experience on the platform.

Literature Review

Research in human verification and anti-bot detection has shifted from traditional CAPTCHA methods to real-time liveness and presence analysis. Studies show that modern bots can bypass CAPTCHA using OCR and AI solvers, making human-presence verification via webcam more reliable. Techniques such as micro-blink detection, head movement tracking, and temporal frame analysis (Parkhi et al., 2015; Boulkenafet et al., 2016) have demonstrated strong performance in distinguishing humans from spoofed inputs without requiring biometric storage. This directly supports Campus Connect's privacy-focused verification approach.

In parallel, advancements in lightweight, locally deployable language models (DistilBERT, ALBERT) show that chatbots can run effectively on local machines with reduced latency and improved privacy. Research highlights that domain-specific, on-device chatbots significantly enhance user experience in contained environments such as campuses or organizations.

For content summarization, hybrid summarization approaches that combine rule-based logic with lightweight AI have proven efficient for environments with limited computational resources. These "simulation logic" methods extract key points from text using structural patterns rather than large transformer models, making them suitable for real-time summarization within Campus Connect.

Finally, literature on recommender systems indicates a growing use of simulation-based preference modeling, especially where large datasets are not available. Agent-like user behavior simulations enable accurate prediction of interests and community affinity, aligning with the AI Simulation Logic–based recommender used in this project.

Proposed Methodology and Architecture Diagram

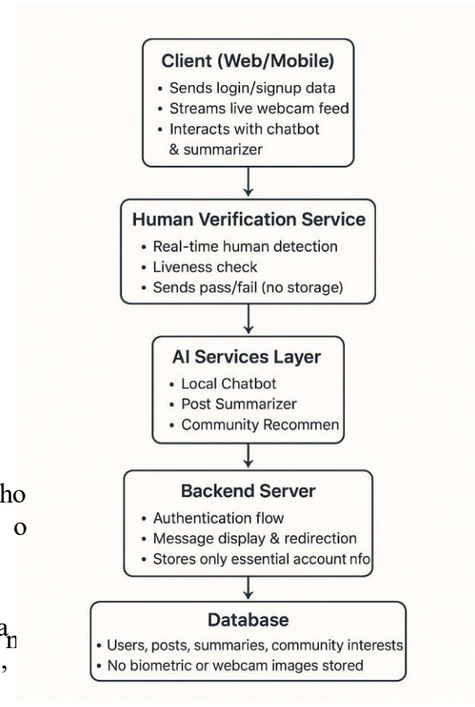
1. Webcam-Based Human Verification:
--Login Flow
-User enters username and password.
-Live webcam stream opens.
-Human presence is verified using:
-Face detection (no identity recognition)
-Micro-movement cues (head movement, blink patterns)
-Anti-spoof heuristics (against images/screens)
-Successful verification → Login granted

--Sign-Up Flow
-User fills credentials..
-Webcam human verification.
-Success message displayed.

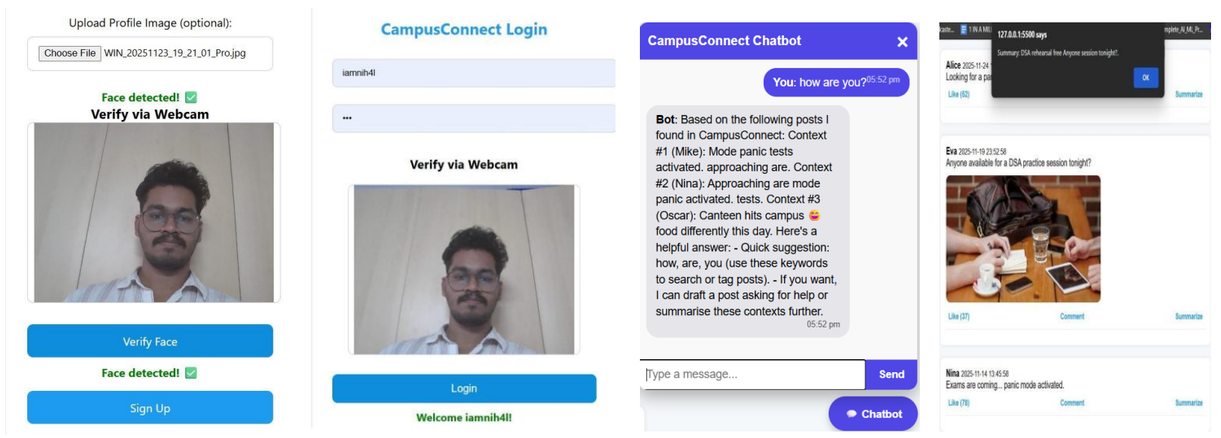
2. . AI Simulation Logic–Based Post Summarizer:
-Summarizes long posts into concise bullet points or sho paragraphs using lightweight simulation logic instead o heavy LLMs, helping users quickly grasp key ideas.

3. Community Recommender:
-Predicts user interests through interaction patterns a simulation logic, recommending relevant communities, clubs, trending posts, and similar users.

4. Locally Trained Chatbot:
-A fast, on-device chatbot that answers campus queries, club and event info, and platform-related questions ensuring privacy without relying on external APIs.



Experimental Results



Conclusion

Campus Connect successfully integrates privacy-focused anti-bot verification, AI-powered user assistance, smart content summarization, and personalized community recommendations, creating a seamless and secure platform for meaningful student interactions.
The webcam-based human verification system ensures that only genuine users gain access, providing a trustworthy environment while safeguarding personal data. Meanwhile, the on-device chatbot and simulation-driven AI tools not only enhance user engagement but also simplify information consumption, enabling users to interact with content more effectively and intuitively By combining advanced AI technologies with robust security measures, Campus Connect represent modern, intelligent, and user-centric approach to building student-focused digital communities. It demonstrates the potential of leveraging AI to foster collaboration, streamline communication, and personalize user experiences in ways that traditional platforms cannot.
Looking ahead, this framework can be further expanded to include more adaptive learning tools, deeper community analytics, and predictive recommendation systems, positioning Campus Connect as a scalable and forward-thinking solution for next-generation digital campus ecosystems.

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