From Alex Nguyen's STS Project:

Towards Better Integration of AI in Academic Advising: Understanding How Human-AI Relationships Influence the Future of Higher Education

The academic environment is always evolving, creating a demand for tools that improve the efficiency and productivity of students and teachers without compromising the human components that are essential to education. Both my capstone project and STS research explores the intersection of how artificial intelligence (AI), specifically large language models (LLMs), can enhance course selection advising while taking into account the societal and human effects. When taken as a whole, these projects examine how technologies can fix inefficiencies in the current academic advising setting, but also complement the advisor roles within higher education institutions.

My capstone project addresses the problem of an inefficient and impersonal course selection for university students. At institutions with a poor advisor to student ratio, students will often struggle to find courses that may align with either their academic goals and personal interests, due to an overwhelming amount of available information or poor search tools. Existing tools such as TheCourseForum provide helpful insights about professors and grading distributions, but lack true personalization. Therefore, the project addresses this gap by proposing a design for a personalized course recommendation system using Retrieval-Augmented Generation (RAG) architecture. The system proposed would leverage domain-specific knowledge bases built from the University of Virginia's (UVA) course catalogs and uses a locally hosted Llama LLM to generate personalized course recommendations, based on student queries. This technical solution improves the overall accessibility and ensures recommendations that are factually based through a controlled knowledge retrieval.

However, creating a technological solution alone is not enough because it is crucial to understand how integrating new technologies, such as AI, into academic advising would reshape the relationships between students and advisors in regards to trust and engagement.

This transition point leads to the broader discussion through analysis of the societal impacts of this integration.

In my STS research, I investigated the integration of AI-based advising tools through the lens of Actor-Network Theory (ANT). This lens enables a holistic view of advising and the dynamic network involving actors such as students, advisors, AI systems, and university policies, rather than isolating a simple student-advisor interaction. In this research, I explored critical issues such as the risks of overreliance of AI recommendations, importance of student trust, and how AI technology would reshape the human advisor's role. By using a mixed-methods approach of literature reviews, case study analysis, and survey data on students' trust, I found that AI can improve advising efficiency. However, there are still weaknesses within the technology as it often lacks the emotional connection and insight that human advisors would uniquely provide to students with respect to academics or life.

Together, my capstone and STS projects showed that integrating AI into academic advising holds great potential, but if approached carefully. Technological tools such as a RAG-based course recommendation system could greatly enhance accessibility and personalization. Yet, as in my STS research, these tools must complement, rather than replace, human advisors. Therefore, these projects argue for a balanced future in which human judgement and AI-driven efficiency work together to improve higher education.