I. The EchoHeart

The EchoHeart project is a pioneering initiative that aims to develop an empathetic AI system, capable of detecting and responding to human emotions. The project combines cutting-edge artificial intelligence, biometric sensors, and computer vision to create a holistic emotional intelligence system.

II. Independent Study Course Description - Math

Course Title: Biometric Signal Processing for Empathetic AI

Course Description: This independent study explores the mathematical foundations of biometric signal processing, focusing on the analysis and interpretation of physiological signals for empathetic AI systems.

Learning Objectives and Outcomes:

- Develop a deep understanding of biometric signal processing techniques and their applications in empathetic AI.
- Implement algorithms for heart rate variability analysis and machine learning models for emotional state classification.
- Design a biometric sensor interface and data acquisition protocol.

III. Independent Study Course Description - Design

Course Title: Empathetic AI System Design and Integration

Course Description: This independent study focuses on the design and integration of an empathetic AI system, incorporating biometric sensors, computer vision, and natural language processing.

Learning Objectives and Outcomes:

- Design a user-centered interface for the empathetic AI system.
- Develop a system to integrate biometric sensor data, computer vision, and natural language processing.
- Implement emotional intelligence capabilities and response strategies.

IV. Project Integration and Collaboration

The Math Independent Study and Design Independent Study courses will work together to achieve the EchoHeart project's goals. Key integration points and milestones include:

MAT will focus on developing the emotional intelligence algorithms and biometric signal processing techniques.

DES will concentrate on designing the user-centered interface, writing reports, and conducting tests to evaluate the system's performance.

Regular meetings and updates will ensure that both courses are aligned and working towards the same goals.

Key integration points and milestones

Week 4: Biometric sensor interface and data acquisition protocol design

Week 6: Emotional intelligence algorithm development and integration

Weeks 8-10: System testing and iteration

Week 12: Final project presentation and demo

V. Project Timeline and Milestones

Weekly Check-Ins : TBD

Week 1-2	Week 3-4	Week 5-6
• Project introduction • Goal setting • Literature review	• Biometric sensor interface • Data acquisition protocol design	• Emotional intelligence algorithm development • Discord API and initial system integration
	Biometric sensor interface design review (Week 4)	Emotional intelligence algorithm review (Week 6)
Week 7-8	Week 9-10	Week 11-12
• Unit testing and integration testing • System-level testing for seamless interaction between components • Identify and address any issues or bugs that arise during testing • Refine the system's performance and accuracy based on testing results	Final project refinement and preparation: • Polish the system's user interface and user experience • Ensure all components are fully integrated and functioning as expected • Prepare the final project presentation and demo • Complete any remaining tasks or deliverables	Final project presentation and demo: • Showcase the fully functional EchoHeart system • Demonstrate its capabilities and features • Receive feedback and evaluation from instructors and peers
System testing and iteration review (Week 8)		Final project submission (Week 12)