Introduction

ConsultAI is an innovative framework that leverages Large Language Models (LLMs) to facilitate ethical deliberation in complex medical scenarios. This state-of-the-art system implements a sophisticated multi-agent architecture that simulates diverse healthcare perspectives, enabling comprehensive ethical analyses for challenging medical cases.

Key Components:

- **Multi-Agent System:** Integrates perspectives from attending physicians, nurse managers, ethicists, and patient advocates
- **Ethical Framework:** Built on core principles of medical ethics - autonomy, beneficence, justice, and resource allocation
- **Advanced LLM Integration:** Utilizes GPT-4 Turbo for sophisticated reasoning and natural language understanding
- **Structured Process:** Implements systematic deliberation protocols with defined rounds and consensus mechanisms

The system excels in analyzing complex medical ethics cases, providing evidence-based recommendations while maintaining transparency and accountability throughout the deliberation process.

Motivation

- Growing complexity in medical ethical decisions
- Need for systematic approach to ethical deliberation
- Limited availability of ethics committees
- Importance of considering multiple stakeholder perspectives
- Demand for rapid but thorough ethical analysis

Multi-Agent Architecture

- Role-specific agents (physician, nurse, ethicist, advocate)
- Specialized knowledge and perspective per agent
- GPT-4 Turbo for enhanced reasoning
- Structured deliberation process

Ethical Framework Integration

- Comprehensive ethical principles coverage:
  - Autonomy
  - Beneficence
  - Justice
  - Resource Allocation
- Case-specific analysis templates
- Systematic deliberation protocols

Technical Implementation

- Python-based modular architecture
- Configuration-driven setup
- Automated deliberation pipeline
- Structured output generation
- FAISS-powered knowledge base

Results

System Capabilities

- Successfully processes complex medical ethics cases across multiple domains:
  - Patient autonomy decisions
  - Resource allocation challenges
  - End-of-life care considerations
  - Treatment plan conflicts
- Demonstrates consistent deliberation patterns
- Maintains ethical principle alignment

Process Achievements

- Structured documentation of ethical reasoning
- Multi-perspective analysis with role-specific insights
- Real-time deliberation tracking
- Transparent decision-making process

Case Study Highlights

- Successful resolution of autonomy cases
- Balanced stakeholder perspective integration
- Clear recommendation documentation
- Traceable reasoning patterns

Impact and Applications

Clinical Settings

- Ethics committee support
- Rapid case analysis
- Professional training tool
- Ethical reasoning documentation

Educational Use

- Medical ethics training
- Case study analysis
- Decision-making frameworks
- Professional development

Future Directions

- Additional specialist roles
- Enhanced real-time capabilities
- Expanded case database
- Advanced consensus algorithms
- Hospital system integration

Contact Information

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