CS486C – Senior Capstone Design in Computer Science

Project Description

Project Title: PureSpective™ An improved approach to AI Solutions	
Sponsor Information: QUANTUM WAYFINDER TECHNOLOGIES™	**David V. Moore Founder & Systems Engineer** **Quantum Wayfinder Technologies™** **Agentic Mind Builder™ - PureSpective™** Bringing sustainable solutions to the world of breaking technology. davidv.moore@gmail.com founder_qwt@proton.me

PureSpective™ Project Overview:

There is no good way to sum up the challenges facing the arena of AI/Large Language Models (LLMs), which are now embedded across legal, medical, educational, operational, and enterprise environments. While these systems demonstrate impressive linguistic fluency, their outputs remain highly sensitive to the quality and structure of human input. Incomplete, ambiguous, or poorly scoped prompts routinely result in hallucinations, reasoning drift, overconfident inaccuracies, and unstable conclusions. These failures are not merely technical inconveniences. In documented real-world cases, unreliable outputs have contributed to decisions that place humans at risk, often through misunderstanding, misplaced trust, or insufficient context rather than malicious intent.

PureSpective™ treats unreliability as both a human–system interaction problem and a software design challenge. Rather than attempting to correct errors after generation, the PureSpective approach improves reliability upstream by restructuring how intent, assumptions, and constraints are articulated before inference occurs. By making context specification explicit, structured, and transparent, the system aims to reduce conditions under which unreliable outputs are likely to emerge, while preserving user agency and understanding.

PureSpective™ centers on the development of a deployable, cross-platform software application that operationalizes a sponsor-developed structured-context methodology known as Agentic Mind Builder™ (AMB). Students will implement a real, user-facing system that allows individuals to engage LLMs more intentionally and safely, while enabling comparative evaluation across multiple AI platforms.

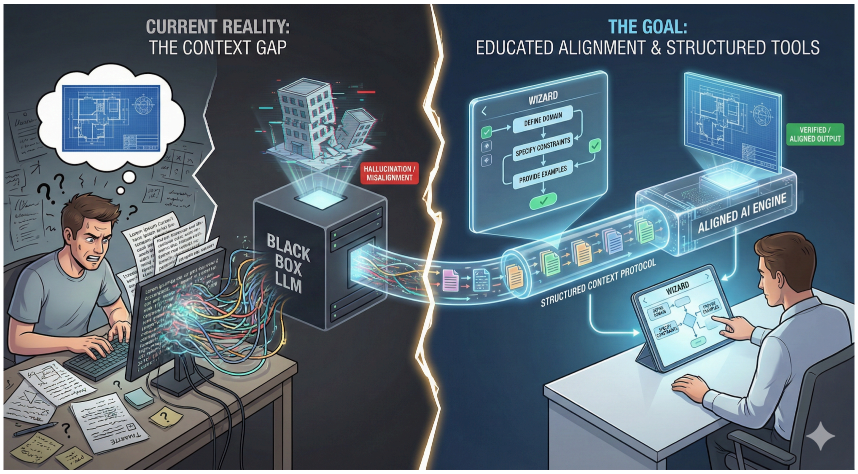
The Problem:

Across industries, LLM failures frequently arise not from adversarial misuse, but from ordinary users interacting with complex probabilistic systems without sufficient awareness of how context framing in prompting influences outcomes.

Legal filings have cited fabricated references, medical discussions have surfaced incorrect guidance, and operational environments have experienced flawed decision support. These cases share a common thread: the absence of structured, well-defined context prior to inference.

COURT RULES: CHATBOT LIES ARE COMPANY LIABILITY
AI LAWYER SANCTIONED FOR FAKE CASES
NYC AI TELLS BUSINESSES TO BREAK LAW
REPORT: 1-IN-5 SECURITY BREACHES LINKED TO AI CODE
Drive-Thru Robots Fail Human Context
MEDICAL AI 'HALLUCINATES' VIOLENT CONTENT IN PATIENT RECORDS
MIT STUDY: AI CHOOSES PATTERNS OVER LOGIC
New 'Prompt Injection' Threatens Enterprise Data

Current tools largely rely on free-form prompting, placing the burden of reliability on the user’s intuition and experience. PureSpective challenges that paradigm by treating context construction as a first-class software concern. The motivation is not to replace human judgment, but to support it by making assumptions visible, encouraging clarification, and reducing ambiguity before outputs are generated.



By focusing on interaction design and structured prompting methodology, this Capstone addresses a widely recognized gap between model capability and real-world reliability, with direct implications for human safety and responsible system use.

Proposed Solution:

Students will design and implement a cross-platform web application named PureSpective™ that serves as a functional wrapper around the core methodology and code engine Agentic Mind Builder™, which they will also assist in refinement. The application will guide users through structured interaction flows composed of predefined questions, constrained input fields, and limited freeform text areas. These flows are designed to help users articulate intent, scope, and assumptions clearly before engaging an LLM. Additional structured prompting is added behind the scenes to improve and enhance LLM performance.

A key feature of the system is explicit platform selection. Users choose the target LLM environment (e.g., ChatGPT, Gemini, Claude, Grok), enabling deterministic, platform-aware configuration adjustments. This allows the system to account for known differences in formatting, instruction hierarchy, and interaction constraints without relying on hidden inference or automated rewriting.
The interface may passively surface informational acknowledgments, clarifying questions, or contextual guidance drawn from a curated knowledge base and FAQ system. All such guidance is deterministic, advisory in nature, and triggered only by explicit user selections. The system does not override user intent, infer behavior, or enforce outcomes. Other platform-specific tools are in the design stage.

Knowledge, skills, and expertise required for this project:

- Experience building web-based or cross-platform applications
- Familiarity with modern UI frameworks and user-centered interface design
- Experience working with databases for structured content (e.g., FAQs, libraries, user data)
- Familiarity with LLM platforms (e.g., ChatGPT, Gemini, Claude, Grok) and prompt construction
- Experience with software testing, validation, and iterative refinement
- Ability to produce clear technical documentation and communicate design decisions
- Comfort working in a team-based, sponsor-engaged capstone environment
- JavaScript / TypeScript, HTML, CSS, modern web frameworks (e.g., React or equivalent), RESTful APIs, relational databases (e.g., PostgreSQL) or NoSQL databases, Git-based version control.
- Later, possible expansion into understanding of client–server architectures and API integration

Equipment Requirements:

- Students will require standard development computers and potentially mobile device
- reliable internet access,
- approved access to LLM platforms, and version control tools

Software and other Deliverables:

- A deployable cross-platform web application implementing the structured context methodology
- Source code repository with documented build and deployment instructions
- Requirements and system design documentation
- Integrated feedback and bug-reporting artifacts and beta evaluation summaries
- Final technical report detailing implementation, testing, findings, and limitations
- Project website including overview, documentation, and electronic project notebook

Student Learning Objectives and Evaluation:

- Full-stack software development
- Cross-platform system design
- Human–computer interaction principles
- Evaluation of probabilistic systems
- Managing ambiguity and uncertainty in real-world software
- Technical documentation and stakeholder communication

Success will be evaluated based on functionality, code quality, clarity of documentation, depth of analysis, and demonstrated understanding of system behavior rather than solely on performance Metrics.

SPONSOR INVOLVEMENT AND PROVIDED RESOURCES

The sponsor will provide background materials, architectural references, example workflows, and optional documentation to support student understanding of the problem domain. These resources are intended to inform and contextualize student work, not prescribe implementation decisions or Outcomes.

The sponsor will act as a technical stakeholder, offering feedback, clarification, and evaluation input throughout the project lifecycle while preserving student ownership of design and implementation choices.

SUMMARY

This Capstone project offers a rigorous, human-centered software challenge grounded in real-world relevance. By addressing both human safety and system reliability through structured context methodology, the project provides students with meaningful experience in building, evaluating, and documenting complex software systems within a two-semester framework.

If successful, the results might help set a standard in the arena of LLM solution applications serving general population up to major enterprise and governmental needs.