

Multi-Agent System Design Report

Generated: 2026-01-07 17:20:10

Overall Design Confidence

Overall Confidence Score: 0.20

Implementation Steps

Step 1: Set up LLM Backbone

Configure and deploy the selected LLM models according to the backbone selection design.

Step 2: Implement Network Topology

Set up the framework architecture and communication topology as specified.

Step 3: Implement Memory System

Build the memory subsystem with the specified types, storage, and retrieval mechanisms.

Step 4: Implement Planning Module

Develop the planning and reasoning capabilities according to the planning design.

Step 5: Define Agent Roles

Implement each agent with its specified role, capabilities, and responsibilities.

Step 6: Integrate Tools

Set up and integrate external tools and APIs as specified in the tool integration design.

Step 7: Implement Environment (if needed)

Build the environment representation and grounding mechanisms if required.

Step 8: Implement Execution Semantics

Set up the execution model, control flow, and concurrency handling.

Step 9: Implement Failure Handling

Add failure detection, recovery mechanisms, coordination policies, and observability.

Design Choices

llm_backbone

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

architecture

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

memory

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

planning

Choice: {'error': 'Validation failed: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment'}

Rationale: Validation error: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment

agent_roles

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

tools

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

environment

Choice: {'error': 'Validation failed: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment'}

Rationale: Validation error: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment

execution

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

failure_handling

Choice: {'error': 'Validation failed: Must consider at least one alternative'}

Rationale: Validation error: Must consider at least one alternative

Architecture Guidance

framework

```
{  
"error": "Validation failed: Must consider at least one alternative"  
}
```

topology

```
{}
```

coordination

execution_model

```
{  
"error": "Validation failed: Must consider at least one alternative"  
}
```

framework_comparison

None

Implementation Roadmap

Phase 1: Foundation

Set up core infrastructure

- Configure LLM backbone models
- Set up basic framework architecture
- Implement basic agent structure

Phase 2: Core Capabilities

Implement core agent capabilities

- Implement memory system
- Add planning module
- Define agent roles and capabilities

Phase 3: Integration

Integrate external components

- Integrate tools and APIs
- Implement environment (if needed)
- Set up execution semantics

Phase 4: Reliability

Add reliability and observability

- Implement failure handling
- Add monitoring and logging
- Test and validate the system

Detailed Design Decisions

LLM Backbone Selection

feature: llm_backbone
decision: { "error": "Validation failed: Must consider at least one alternative" }
alternatives_considered: []
justification: { "summary": "Validation error: Must consider at least one alternative", "tradeoffs": [] }
limitations: ["Invalid output format: Must consider at least one alternative"]
assumptions: []
evidence: []
risk_assessment: { "risk_level": "high", "primary_risks": ["Invalid output"], "mitigations": [] }
confidence_score: 0.2

Environment Representation

feature: environment
decision: { "error": "Validation failed: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment" }
alternatives_considered: []
justification: { "summary": "Validation error: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment", "tradeoffs": [] }
limitations: ["Invalid output format: Missing required fields: feature, decision, alternatives_considered, justification, limitations, assumptions, evidence, risk_assessment"]
assumptions: []
evidence: []
risk_assessment: { "risk_level": "high", "primary_risks": ["Invalid output"], "mitigations": [] }
confidence_score: 0.2

Failure Handling

feature: failure_handling
decision: { "error": "Validation failed: Must consider at least one alternative" }
alternatives_considered: []
justification: { "summary": "Validation error: Must consider at least one alternative", "tradeoffs": [] }
limitations: ["Invalid output format: Must consider at least one alternative"]
assumptions: []
evidence: []
risk_assessment: { "risk_level": "high", "primary_risks": ["Invalid output"], "mitigations": [] }
confidence_score: 0.2

