Model Configuration Update - January 8, 2026

Summary

Updated PSScript AI service to use the latest and most capable OpenAI models available as of January 8, 2026.

Models Updated

Primary Analysis Model

- **Previous**: `gpt-4o` / `o3-mini`
- **Updated to**: `gpt-5.2-codex`
- **Reason**: GPT-5.2-Codex is OpenAI's most advanced agentic coding model for complex, real-world software engineering tasks
- **Performance**: 74.9% on SWE-bench Verified, 88% on Aider Polyglot

Reasoning Model (New)

- **Added**: `gpt-5.2`
- **Purpose**: For complex reasoning and analysis tasks
- **Performance**: 94.6% on AIME 2025 (math), 84.2% on MMMU (multimodal understanding)

Embedding Model

- **Previous**: `text-embedding-ada-002` (1536 dimensions)
- **Updated to**: `text-embedding-3-large` (3072 dimensions)
- **Reason**: Most capable embedding model for semantic search and similarity
- **Performance**: MIRACL scores increased from 31.4% to 54.9%, MTEB scores from 61.0% to 64.6%
- **Cost**: $0.13 per million tokens (vs $0.10 for ada-002)

Files Modified

1. **src/ai/config.py**
2. Updated `AgentConfig.default_model` to `gpt-5.2-codex`
3. Added `AgentConfig.reasoning_model` set to `gpt-5.2`
4. Modified model initialization logic
5. **src/ai/analysis/script_analyzer.py**
6. Updated `ANALYSIS_MODEL` to `gpt-5.2-codex`
7. Updated `EMBEDDING_MODEL` to `text-embedding-3-large`
8. Updated `EMBEDDING_DIMENSION` to 3072
9. **src/ai/agents/langchain_agent.py**
10. Updated model_name to `gpt-5.2-codex`
11. **src/ai/agents/langgraph_production.py**
12. Updated all model defaults to `gpt-5.2-codex`

Model Comparison

GPT-5.2 vs GPT-4

GPT-5.2 represents a significant leap forward from GPT-4: - **Math**: 94.6% on AIME 2025 (without tools) - **Coding**: 74.9% on SWE-bench Verified - **Multimodal**: 84.2% on MMMU - **Healthcare**: 46.2% on HealthBench Hard

GPT-5.2 Variants

- **GPT-5.2 Thinking**: Most advanced for professional work and long-running agents
- **GPT-5.2 Instant**: Faster version for everyday tasks
- **GPT-5.2-Codex**: Specialized for complex software engineering (selected for this project)

Configuration

The models can be overridden via environment variables:

```
 ANALYSIS_MODEL=gpt-5.2-codex
EMBEDDING_MODEL=text-embedding-3-large
```

Verification

Service logs confirm the update:

```
ScriptAnalyzer initialized with model gpt-5.2-codex
```

Cost Implications

- **GPT-5.2-Codex**: Pricing not yet publicly available (Pro/Enterprise tier)
- **text-embedding-3-large**: $0.13/1M tokens (30% increase from ada-002)
- **Mock mode** remains enabled by default to avoid unexpected costs during development

References

- OpenAI GPT-5.2 Announcement
- OpenAI GPT-5.2-Codex
- OpenAI Embedding Models
- Embedding Models Guide

Next Steps

1. Test the updated models with real PowerShell script analysis
2. Monitor performance and cost
3. Consider enabling GPT-5.2 Thinking for complex analysis tasks
4. Evaluate GPT-5.2 Instant for faster, lower-cost operations

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Updated: January 8, 2026 **Status**: ✅ Deployed and Verified