Data and Code Availability Statement

All code, data, and materials required to reproduce the results in this paper are publicly available.

Code Repository

The complete implementation is available at:

`https://github.com/davidahmann/coherism/tree/main/alfm_bem`

Contents

The repository includes:

- **Source code**: Complete implementation of the ALFM-BEM architecture, including:
  - Bidirectional Experience Memory (BEM) with risk, success, and coverage signals
  - Consensus Engine with Trust, Abstain, Escalate, and Query actions
  - Bounded Adapters with gradient clipping, norm projection, and EMA smoothing
  - Contrastive Projection layer for high-dimensional embedding spaces
- **Experiments**: Scripts to reproduce all experimental results:
  - `ablation_study.py`: Multi-seed ablation comparing BEM, RAG, and NEP baselines
  - `threshold_sensitivity.py`: Parameter sensitivity analysis
  - `domain_shift_experiment.py`: Adapter stability under distribution shift
  - `real_backbone_experiment.py`: Integration with sentence-transformers
  - `healthcare_simulator.py`: Healthcare claims processing case study
- **Documentation**: Instructions for installation, configuration, and reproducing all figures and tables

Reproducibility

All experiments use fixed random seeds for reproducibility. The multi-seed experiments report mean ± standard deviation over 5–10 seeds to establish statistical significance. Hardware requirements are modest: experiments run on standard CPU (M2 Pro) or GPU (NVIDIA T4/A100).

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