Mohamed Samir Abdelrahman Selim

Role: Independent Researcher & AI Safety Systems Architect
Location: Egypt
ORCID: 0009-0001-2930-3609
Primary Focus: AI Governance, Model Reliability, Symbolic Stability Criteria, and Stochastic LLM Control

1. Executive Profile

Independent researcher with 20+ years of professional leadership, strategic analytical experience, and complex systems evaluation. Specialized in designing sovereign AI governance frameworks, deterministic verification layers, and topological stability criteria for large language models (LLMs) and complex symbolic systems. Creator of the AXIOM-1 (A1M) governance matrix and GRACE release architecture, aimed at solving concessive bias, stochastic hallucination, and structural failure modes in deep neural networks.

2. Areas of Expertise & Core Competencies

- **AI Safety & Governance Architecture:** Designing non-intrusive control matrices, output reliability verification, and governed deployment pipelines (A1M, GRACE).
- **Complex Systems & Symbolic Stability:** Structural deviation detection, non-linear system stability metrics, and catastrophic failure prevention (USG framework).
- **Deep Learning Analysis:** Generalization behavior in neural networks, spurious periodic generalization detection (PGVP).
- **Theoretical Physics & Mathematical Modeling:** Topological stability, universal resonance modeling, and analytical physics simulations.
- **Technical Implementation & Prototyping:** Algorithmic modeling in Python (NumPy, SciPy, Matplotlib, Astropy), Google Colab deployment, Hugging Face Spaces integration, and GitHub repository architecture.

3. Key Academic Preprints & Research Publications

Title & Framework	Date	Repository / Identifier	Key Contribution
A1M (AXIOM-1 Sovereign Matrix)	April 2026	Zenodo (DOI: 10.5281/zenodo.19608960) Hugging Face / GitHub	Framework governing output reliability in stochastic LLMs via deterministic external verification layers.

Title & Framework	Date	Repository / Identifier	Key Contribution
GRACE (Governed Release Architecture)	March 2026	Zenodo (DOI: 10.5281/zenodo.19256386) OSF (DOI: 10.17605/OSF.IO/296KP)	Controlled excellence release architecture for AI governance and safe deployment standards.
USG (Universal Stability Criterion)	March / April 2026	Zenodo (DOI: 10.5281/zenodo.18883274)	Detecting structural deviation before catastrophic collapse in symbolic complex systems.
PGVP (Spurious Periodic Generalization)	February 2026	Zenodo (DOI: 10.5281/zenodo.18576471)	Analyzing periodic generalization flaws and failure modes in deep neural architectures.
M.SφCDM (Topological Stability Theory)	May 2026	Zenodo (DOI: 10.5281/zenodo.20090819)	Emergent golden ratio as a topological determinant for cosmic action and microscopic systems.
URT (Universal Resonance Theory)	January 2026	Zenodo (DOI: 10.5281/zenodo.18601436) SSRN (DOI: 10.2139/ssrn.5996974)	Mathematical resonance model analyzing frequency stability across complex physical systems.

4. Technical Artifacts & Open-Source Implementations

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  Hugging Face Spaces: Interactive demonstration environments for validating LLM output governance and stability criteria.
- **GitHub Repositories:** Open-source Python implementations for symbolic system stability metrics, synthetic verification logic, and numerical simulations.
- **OSF & Zenodo Open Access Repositories:** Publicly distributed preprints, documentation, and dataset configurations.

5. Professional Background & Technical Experience

Independent Researcher & AI Governance Systems Architect (2025 – Present)
Lead researcher responsible for theoretical formulation, algorithmic validation, mathematical modeling, and open-source release of research preprints in AI safety, formal logic, and complex systems.
Senior Technical & Commercial Operations Specialist (20 Years Experience)

Extensive background in operations management, strategic negotiation, and commercial leadership across major technical sectors in Egypt (Air Conditioning and Real Estate industries). Demonstrated expertise in analytical problem solving, system workflow optimization, and high-level project coordination.

6. Technical Stack & Tools

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  Languages & Libraries: Python, NumPy, SciPy, Matplotlib, Astropy
- **Platforms & Environments:** Google Colab, GitHub, Hugging Face, SSRN, Zenodo, OSF
- **Methodologies:** Formal Logic Analysis, Symbolic Systems Evaluation, Stochastic Output Governance, Topological Stability Analysis