SLIC.AI

Unveiling Hidden Patterns, Predicting Critical Outcomes

Application Area

Sector: Advanced Computing, Artificial Intelligence and Cyber Security

Area: AI, Machine Learning, & Cyber Security

Industry: Intelligence & Surveillance

Market: Cyber security

Partnership Opportunities

This is a startup and license opportunity.

- ☐ Cooperative Agreement
- ☑ License
- ☐ Tech Assistance
- ☑ Start-up

Technology Readiness Level 6

A representative model or prototype system tested in a relevant environment.

IP Information

One full patent

Two provisional patents

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Overview

SLIC.AI is an advanced suite of tools that significantly enhances intelligence and counterintelligence operations. It employs deep big-data analytics to uncover hidden patterns and characteristics within extensive datasets. This platform swiftly classifies, provides insights, and forecasts outcomes, delving into a vast array of publicly accessible scientific articles and other documents, reaching depths of analysis unattainable by existing methods. SLIC.AI's effectiveness has been substantiated through multiple practical field demonstrations, including:

- Discovery of emerging research trends within a subject of interest;
- Detection of trend shifts that may signal changes in institutional focus or the rise of new technologies;
- Analysis of research activities, trends, and unseen networks to map scientific field and forecast innovation paths;
- Cyber threat detection;
- Modeling patterns for emergency response in electrical power grid & nuclear incidence response.
- Data super-compression
- Domain-specific generative AI, RAGs and Knowledge Graphs

SLIC.AI works seamlessly with its sister AI capability, Anomaly Learning in Emergency Tracking Situations (ALERTs), a tool for fingerprinting and detecting various anomalies for rapid/real-time identification, characterization, and classification of data from both labeled and unlabeled extra-large datasets for a wide variety information needs.

Unlike existing AI products targeting military and national security needs, SLIC.AI distinguishes itself by building advanced knowledge graphs. This capability enables the visualization and computational handling of complex interrelationships that are uniquely accessible and efficient for specific queries and analyses.

Advantages

Its state-of-the-art methods:

- Identify and extract latent features in very large data sets
- Offers explainable machine learning
- Makes informative, robust predictions
- Determines dependencies automatically

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Technology Description

SLIC.AI provides explainable unsupervised learning, text mining, features extraction, dimension reduction, anomaly detection, data completion, data fusion, and data compression of extra-large datasets of sparse and dense data beyond the reach of state-of-the-art methods. The platform includes non-negative tensor network algorithms that analyze very high-dimensional tensors. SLIC.AI has developed the first distributed non-negative tensor train (TT) network. TT network is very effective for super compression (> 106) of high-dimensional data. For ultra-large low-dimensional objects, SLIC.AI utilizes Quantized Tensor Train (QTT), which reshapes large vectors and matrices into d-dimensional tensors with a small number of elements in each dimension. QTT also achieves a super-compression. Applying a hybrid TT/QTT format, SLIC.AI reached yottabyte-sized compression of real neutron transport matrix operators. SLIC.AI can distill and curate highly specific text corpora to build specific structures in Knowledge Graphs (KG). This ability of SLIC.AI serves to fine-tune LLMs and minimize hallucinations of Generative AI applications.

Market Applications

SLIC.AI is a platform capability that can be applied to many market opportunities and needs as it has demonstrated its capabilities in several industries and dozens of applications, including

- Threat detection and surveillance:
  - Enhanced text mining for national security and public safety
  - Human activities based on low-level signals
  - Building RAG and KG and domain-specific mini AI for very specific topics
- Medical
  - Improved identification of protein structures and defects that cause disease
  - Extracts unique medical information from genomic data
  - Building domain-specific mini AI for rare diseases
- Energy extraction
  - Increased extraction efficiency for oil and gas
  - Affordable extraction of green geothermal energy
- Anomaly detection in cybersecurity
  - Detection of malicious activities in User-Source and User-Destination data
  - Detection of patient and persistent attackers

Next Steps

The SLIC.AI Team and Feynman Center for Innovation Team are assessing timely and suitable market opportunities for this platform to target applications in high demand within the national security market. This opportunity has been designated as a startup and licensing opportunity, dependent on current team members' interest in commercializing this platform.

Additional Information

https://smart-tensors.lanl.gov/

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