Job Description

Position Review

Position Number		Position Type		Subject to Radiation	No		Subject to GD	No
Hyperion Position Number		Fund Type	EBF	Parent Position	018168| Team Leader (SGIS-AMT)			
Organization	SGIS – Application MaintenanceTeam	FTE		CCOG 1	1A05B			
Grade	P3	Duty Station	DS - IAEA VIENNA	CCOG 2				
Classified Grade		Position Title	Artificial Intelligence Engineer					

Job Description Review

Organization Settings

The Department of Safeguards carries out the IAEA's duties and responsibilities as the world's nuclear inspectorate, supporting global efforts to stop the spread of nuclear weapons. The primary role of the Department is to develop and implement IAEA safeguards to ensure that there is no diversion of declared nuclear material from peaceful activities and no indications of undeclared nuclear material or activities in a State as a whole.

The Department comprises nuclear safeguards inspectors, responsible for carrying out inspections and verifications of all-safeguards relevant information for nuclear facilities in over 180 States; and technical staff responsible for a wide range of activities including: developing concepts and approaches for implementing safeguards; developing and maintaining safeguards equipment; providing analytical and laboratory services for sample analysis; collecting, evaluating and analysing safeguards-relevant information; providing information and communication technology infrastructure and services; and providing programme coordination support.

The Office of Information and Communication Systems (SGIS) is responsible for the provision of secure Information and Communication Technology (ICT) services that enable the Department of Safeguards to deliver on its mandate. Major services provided by SGIS include provision of information technology project management services; development and maintenance of specialized ICT solutions; operation of resilient ICT infrastructure; provision of customer support services; and protection of safeguards information. In partnership with other organizational entities, SGIS is responsible for planning and implementing ICT strategies as well as promoting ICT standards.

Main Purpose

Reporting to the Team Leader, the Artificial Intelligence (AI) Engineer designs, develops, and deploys innovative solutions tailored to the mission of the Department of Safeguards. The AI Engineer provides expertise in machine learning, natural language processing, and data engineering to enhance business processes and systems, applying technical knowledge to design, build, and implement effective, secure and mission-specific AI solutions, deployed in an on-premises infrastructure. This role contributes to enhancing the IAEA's safeguards verification capabilities by building next-generation intelligent systems and developing advanced retrieval architectures, integrating knowledge graphs, and deploying state-of-the-art large language models (LLMs) in support of advanced analytical and decision-making workflows.

Role
The AI Engineer is: (1) an agile technical expert, implementing complex AI/ML initiatives and customizing and fine-tuning open source LLMs; (2) an AI solutions developer, designing and implementing end-to-end Retrieval-Augmented Generation (RAG) based solutions, graph-based retrieval, and hybrid search strategies, optimized for secure on-premise environments; (3) a Data engineer using industry standard data engineering frameworks to create and maintain data pipelines to serve the AI/ML solutions.

Partnership
The AI Engineer works in close collaboration with colleagues within the Division, including those already engaged in ML and AI engineering, software development, information security, and infrastructure teams, to ensure seamless integration of AI components within existing and new systems. The AI Engineer collaborates with multidisciplinary stakeholders across the Department to translate analytical needs, automation requirements and domain-specific challenges into actionable ML/AI solutions, including participating in cross-functional working groups and project teams. In addition, the AI Engineer interfaces with external technology partners, open-source communities, and research entities, ensuring the IAEA remains aligned with evolving best practices in machine learning, retrieval architectures and AI governance.

Functions / Key results Expected

AI Application Development
- Deliver high-impact, secure, and scalable cutting-edge AI and ML capabilities that support safeguards verification and analytical decision-making.
- Design and maintain Python-based ML services with a focus on modularity, scalability, and performance.
- Build RAG systems using embedding models, vector stores, and hybrid retrieval (dense/sparse/graph-based).
- Customize and fine-tune LLMs using LoRA, adapters, or prompt tuning for domain-specific use.
- Contribute to the definition of best practices for AI development in regulated and secure environments.

Knowledge Graph & Database Integration
- Integrate vector and graph databases (e.g. ChromaDB, Neo4j) to support structured and semantic retrieval.
- Engineer data pipelines for training and inference, including preprocessing and knowledge enrichment.

Deployment and Infrastructure
- Develop and manage containerized services using Kubernetes (Rancher) and Docker.
- Integrate CI/CD workflows using TFS for streamlined MLOps and delivery pipelines.

Collaboration & Delivery
- Translate project goals into technical deliverables with clear documentation and sprint contributions.
- Conduct code reviews, testing, and performance tuning in an agile, cross-functional setting.

Innovation & Continuous Learning
- Monitor trends in LLMs, RAG, and graph learning; prototype new methods and recommend improvements.
- Support future extensions involving accuracy benchmarking and fine-tuning experiments.
- Evaluates and integrates new AI technologies and frameworks to enhance existing systems.

Competencies

Core Competencies

Competency	Occupational Role	Definition
Communication	Individual Contributor	Communicates orally and in writing in a clear, concise and impartial manner. Takes time to listen to and understand the perspectives of others and proposes solutions.
Achieving Results	Individual Contributor	Takes initiative in defining realistic outputs and clarifying roles, responsibilities and expected results in the context of the Department/Division's programme. Evaluates his/her results realistically, drawing conclusions from lessons learned.
Teamwork	Individual Contributor	Actively contributes to achieving team results. Supports team decisions.
Planning and Organizing	Individual Contributor	Plans and organizes his/her own work in support of achieving the team or Section's priorities. Takes into account potential changes and proposes contingency plans.

Functional Competencies

Competency	Occupational Role	Definition
Client orientation	Associate	Establishes effective relationships with clients to understand and meet or exceed their needs. Finds ways to ensure client satisfaction.
Commitment to continuous process improvement	Associate	Identifies opportunities for process, system and structural improvement as well as improving current practices, increasing effectiveness and achieving efficiency gains. Actively supports the application of sound quality management standards and process improvement.
Judgement/decision making	Associate	Consults with supervisor/manager and makes decisions in full compliance with the Agency's regulations and rules.

Expertise

		Requirement/ Asset
Information Technology | Software Development	Proficiency in designing and deploying Retrieval-Augmented Generation (RAG) pipelines, including working with embedding models, vector stores (e.g. ChromaDB), and graph databases (e.g. Neo4j) for advanced semantic search capabilities.	Required
Information Technology | Software Engineering	Advanced proficiency in Python, with the ability to design modular, ML services and write clean, maintainable code following best practices in software engineering and agile development.	Required
Information Technology | Systems Analyst	Expertise in customizing and optimizing large language models (LLMs) using techniques like LoRA, prompt tuning, or adapter modules to meet domain-specific requirements in a secure and scalable environment.	Required
Information Technology | Database Management	Deep knowledge of vector databases (e.g. ChromaDB, FAISS) and hybrid retrieval strategies.	Required

Languages

Languages	Asset Languages
English	Arabic; Chinese; French; Russian; Spanish

Qualification	
Qualification Title	Description
Bachelor's Degree	University degree in an engineering or computer science discipline or a related field.

Experience
Minimum of five years of experience working with AI enhanced solutions, including integration into existing applications to provide advanced AI-driven capabilities with at least three years of experience in data engineering and data pipeline development. Practical experience in the following required: - Graph-RAG, knowledge graphs, and graph-based learning; - machine learning algorithms and natural language processing (NLP) techniques; - development of prompt engineering techniques to enhance the performance and capabilities of language models; - development and deployment of citation-supported Retrieval-Augmented Generation (RAG) based solutions. Experience with any of the following an asset: - LLM Foundational Models, such as GPT-4, BERT, LLaMA, Mistral; - model training or fine-tuning; - familiarity with AI frameworks and libraries such as TensorFlow, PyTorch, or similar; - proficiency in containerized deployments using Docker and Kubernetes; - familiarity with MLOps practices, DevOps workflows, and CI/CD pipelines; - collaborative experience in multi-disciplinary, international teams.