

Integrating AI with Modern Software Applications

Course Description

This course equips students with the expertise to design and implement AI solutions that align with modern application architectures and integration practices. They will gain a deep understanding of AI system architecture and learn how to structure solutions that seamlessly integrate into software ecosystems.

Skills

AI System Architecture

- Explain the impact of architecture patterns on the scalability of AI models. Explain the difference between vertical scaling and horizontal scaling in AI model development and discuss real-world challenges associated with scaling AI architecture.
- Evaluate resource management techniques in AI production environments and their impact on operational efficiency.
- Explain and select performance optimization approaches for AI models in production environments.
- Analyze AI-driven techniques for real-time resource management and the proactive monitoring of system performance bottlenecks.
- Compare and evaluate off-the-shelf and custom-built AI solutions based

on ease of implementation and adaptability to specific business needs.

- Analyze how security considerations, integration costs, long-term maintenance, and technical debt influence the selection of off-the-shelf versus custom-built AI solutions.

Integration Strategies

- Describe business disruptions related to AI integration, including security risks associated with integrating AI into business systems.
- Explain governance risks, including legal, ethical, and compliance, associated with AI integration.
- Examine the technical risks associated with integrating AI into applications and adopt a risk assessment framework to categorize them.
- Describe strategies that mitigate privacy concerns with AI systems.
- Examine strategies to ensure compliance with data protection regulations and safeguard user privacy in AI systems.
- Analyze internal and external threats to AI systems and implement appropriate security measures to mitigate risk.

Skills Cont.

Data Management and Processing

- Explain the impact of incomplete data on AI model performance and describe strategies for managing incomplete data. B. Analyze and apply dataset validation principles to evaluate the accuracy, completeness, and distribution of data used in AI model training.
- Describe and evaluate data currency and data relevancy in AI models.
- Explain common sources for structured and unstructured data.
- Articulate the methods to ingest, transform, and process structured and unstructured data for AI systems.

System Deployment and Monitoring

- Describe key components related to AI model deployment.
- Explain how to deploy an AI model in the cloud.
- Describe key performance metrics for AI model deployment.
- Describe methods for continuous monitoring of AI models after deployment.
- Describe rollback strategies that minimize downtime and preserve data integrity in the event of AI system failures during and after deployment.
- Explain resource optimization techniques to control AI deployment costs in the cloud.