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NVIDIA NCA-GENM Exam Syllabus Topics:

Section	Weight	Objectives
Multimodal Data	15%	- Data preprocessing, fusion, and representation - Multimodal model architectures and integration - Characteristics of text, image, and audio data
Performance Optimization	10%	- Hardware acceleration with NVIDIA platforms - Scalability and deployment considerations - Model efficiency and inference optimization
Core Machine Learning and AI Knowledge	20%	- Neural network architectures relevant to multimodal systems - Fundamental concepts of machine learning and deep learning - Generative AI principles and techniques
Data Analysis and Visualization	10%	- Interpretation of generative AI outputs - Visualization techniques for model behavior and results - Analyzing multimodal datasets and outputs
Trustworthy AI	5%	- Reliability, fairness, and safety in generative systems - Ethical considerations and responsible use - Robustness and error mitigation

Experimentation	25%	- Experiment design and methodology - Metrics and validation strategies for generative models - Model training, fine-tuning, and evaluation
Software Development and Engineering	15%	- Development workflows for generative AI applications - Libraries, frameworks, and tools for multimodal AI - Best practices for building and maintaining systems

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NVIDIA Generative AI Multimodal Sample Questions (Q42-Q47):

NEW QUESTION # 42
Consider a scenario where you are building an autoencoder using a U-Net architecture. What loss function is generally considered MOST suitable for training this autoencoder, particularly when the goal is to generate high-quality images?

- A. Cross-entropy loss
- B. Binary Cross-entropy loss
- C. Mean Squared Error (MSE) loss
- D. Structural Similarity Index Measure (SSIM) loss
- E. Hinge Loss

Answer: C

Explanation:
Mean Squared Error (MSE) loss is commonly used for training autoencoders, including those based on IJ-Net architectures, when the goal is to reconstruct images. MSE measures the average squared difference between the original and reconstructed images. While SSIM focuses on structural similarity, MSE provides a more direct pixel-wise comparison. Cross-entropy and binary cross-entropy are more suitable for classification tasks.

NEW QUESTION # 43
You are building a multimodal model for medical image diagnosis, using both radiology images (e.g., X-rays) and patient clinical notes.
The clinical notes are highly unstructured and contain significant medical jargon. What preprocessing steps would be MOST effective for improving the model's performance?

- A. Translating the clinical notes into multiple languages and then back-translating to the original language.
- B. Applying basic text cleaning (removing punctuation, converting to lowercase) and using a standard word embedding (e.g., Word2Vec).
- C. Utilizing named entity recognition (NER) to identify medical entities (diseases, medications, etc.), and employing a medical-specific language model (e.g., BioBERT) for text embeddings.
- D. Performing sentiment analysis on the clinical notes.
- E. Directly feeding the raw clinical notes into the model without any preprocessing.

Answer: C

Explanation:
For medical text, NER and BioBERT are the best choice. NER extracts relevant medical information, while BioBERT is pre-trained on a large corpus of biomedical text, allowing it to better understand medical jargon and context. Raw text (A) would be ineffective. Basic cleaning and Word2Vec (B) are insufficient for complex medical language. Translation (D) isn't the primary preprocessing step

needed. Sentiment analysis (E) is You have a multimodal generative model that produces images from text descriptions.

NEW QUESTION # 44
You are tasked with evaluating the trustworthiness of a multimodal A1 model that predicts diagnoses based on medical images and patient history text. Which of the following evaluation metrics or techniques are MOST relevant for assessing the model's trustworthiness in this critical application?

- A. Robustness testing by introducing adversarial perturbations to the input data.
- B. Measuring inference throughput (samples per second).
- C. Calibration error, measuring the alignment between predicted probabilities and actual outcomes.
- D. Attribution methods (e.g., Grad-CAM) to visualize which parts of the image and text the model focuses on.
- E. Accuracy and F1-score on a held-out test set.

Answer: A,C,D

Explanation:
Trustworthiness goes beyond simple accuracy. Calibration error assesses how well the model's predicted probabilities reflect the true likelihood of the diagnosis. Attribution methods provide insights into the model's reasoning process, helping to identify potential biases or reliance on irrelevant features. Robustness testing assesses the model's sensitivity to noise and adversarial attacks, which can indicate vulnerability to manipulation. Accuracy and F1-score are important but insufficient for trustworthiness. Throughput is a performance metric, not a trustworthiness metric.

NEW QUESTION # 45
Consider a scenario where you are building a multimodal model to generate realistic indoor scenes. You have access to text descriptions of the scene, 3D models of furniture, and ambient sound recordings. Which of the following loss functions would be most appropriate to ensure coherence and realism in the generated scenes?

- A. Cross-entropy loss for classifying different object categories in the scene.
- B. Mean Squared Error (MSE) between the generated image and a reference image.
- C. Cosine similarity loss between the generated image and the input 3D models.
- D. KL Divergence loss between the generated sound and the input text.
- E. A combination of adversarial loss (GAN) to ensure realism, a perceptual loss to match high-level features, and a semantic consistency loss to align the generated image with the input text description.

Answer: E

Explanation:
A combination of adversarial loss, perceptual loss, and semantic consistency loss provides the best approach. Adversarial loss enhances realism, perceptual loss focuses on high-level feature matching, and semantic consistency loss aligns the generated image with the input text, ensuring a coherent and realistic scene.

NEW QUESTION # 46
You are building a multimodal Generative A1 system to generate image captions based on both the visual content of an image and a short audio description of the scene. Which architectural approach would be MOST effective for fusing these two modalities into a coherent representation for caption generation?

- A. Ignore the audio entirely, as images are sufficient for generating captions.
- B. Early Fusion: Concatenate the raw image pixel data with the raw audio waveform data before feeding it into a single model.
- C. Intermediate Fusion: Train separate image and audio encoders, then use cross-attention mechanisms to allow the image features to attend to the audio features (and vice-versa) at multiple layers of the model.
- D. Concatenate the image file name with the audio file name before feeding into the LLM.
- E. Late Fusion: Train separate image and audio encoders, then concatenate their high-level feature vectors before feeding into a caption generation model.

Answer: C

Explanation:
Intermediate Fusion, particularly using cross-attention, allows for nuanced interaction between the modalities at multiple levels of

abstraction. Early fusion is generally ineffective due to the vast differences in data type. Late fusion may miss important correlations. Ignoring a modality is obviously suboptimal when aiming for multimodal understanding.

NEW QUESTION # 47

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The NVIDIA Generative AI Multimodal (NCA-GENM) certification exam is one of the hottest and most industrial-recognized credentials that has been inspiring beginners and experienced professionals since its beginning. With the NVIDIA Generative AI Multimodal (NCA-GENM) certification exam successful candidates can gain a range of benefits which include career advancement, higher earning potential, industrial recognition of skills and job security, and more career personal and professional growth.

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