J-BHI Special Issue on "Orchestrating Biomedical Breakthroughs through the Fusion of NLP Techniques and GPT Transformers"

The integration of natural language processing (NLP) techniques with Generative Pre-trained Transformer (GPT) models shows great promise for biomedical applications. GPT models possess impressive language generation abilities and contextual understanding, which can be combined with NLP to enhance various biomedical tasks. Biomedical text generation, medical question-answering systems, and clinical decision support systems can all benefit from this integration. Some potential applications include generating scientific abstracts, literature summaries, and patient reports. Medical question-answering systems can provide accurate responses to queries about medical literature, treatments, and diseases. Clinical decision support systems can aid healthcare professionals in diagnosing diseases, suggesting treatments, and predicting patient outcomes. Moreover, the integration can be applied to drug discovery, biomedical information extraction, and clinical documentation improvement. However, there are several challenges in integrating NLP techniques with GPT models for biomedical applications. Limited availability of high-quality labelled data specific to the biomedical domain makes it difficult to effectively fine-tune GPT models. Obtaining large-scale, annotated biomedical datasets is essential to train models that understand the complex terminology and context of the medical field. Furthermore, the rapid evolution of medical knowledge and terminology requires continuous updates and retraining of models to ensure their relevance and accuracy. Interpreting GPT models is another challenge, as understanding their decision-making process and ensuring transparency is crucial for building trust and facilitating adoption in biomedical applications. Ethical considerations regarding patient privacy, data security, and bias mitigation are also vital when dealing with sensitive biomedical information. Addressing these challenges is essential to fully harness the potential of NLP and GPT integration for biomedical applications and ensure their safe and effective deployment in real-world healthcare settings. This special issue focuses on the latest developments and technologies pertaining to *Biomedical Breakthroughs through the Fusion of NLP Techniques and GPT Transformers*, specifically on innovation, validation and demonstration in biomedical applications.

Only high-quality and original contributions will be considered. Topics of interest include, but are not limited to
- Augmenting clinical decision-making with NLP and GPT
- Biomedical text generation with GPT models
- Enhancing medical question-answering systems using NLP techniques
- GPT-based drug discovery and development
- NLP and GPT for improving clinical documentation accuracy
- Biomedical named entity recognition using GPT models
- Adverse drug event detection through NLP and GPT
- GPT-driven analysis of electronic health records for clinical insights
- Context-aware biomedical information extraction using NLP and GPT
- Language generation for patient education using NLP and GPT
- GPT-powered natural language understanding in healthcare chatbots
- Sentiment analysis of patient feedback using NLP and GPT
- GPT-based analysis of social media data for public health surveillance
- Personalized healthcare recommendations using NLP and GPT

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