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Visual AI Explanations in Diagnostic Imaging: Building Trustworthy Intelligent Healthcare Systems

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Abstract

Advancements in artificial intelligence (AI) have significantly reshaped diagnostic imaging, accelerating and refining the assessment of patient images across modalities including X-ray, CT, MRI, and ultrasound. The rapid evolution of deep learning models has enabled automated pattern recognition, disease prediction, and personalized decision support, offering unprecedented opportunities for clinical care. However, the complexity and opacity of these algorithms raise concerns about reliability, accountability, and trust—especially in life-critical healthcare environments where transparent decision-making is paramount. Explainable AI (XAI) addresses these challenges by making the logic and reasoning of intelligent systems interpretable for clinicians, facilitating the validation of diagnoses, identification of biases, and effective collaboration between human and artificial intelligence. This chapter presents a comprehensive survey of XAI methods in medical imaging, emphasizing both visual and intrinsic explanation techniques, with a focus on their implementation, evaluation, advantages, limitations, and practical impact on trustworthy clinical workflows. The aim is to provide actionable guidance for building intelligent imaging systems that inspire clinician confidence and enable safe, effective patient care.

Key words: Explainable AI, Diagnostic Imaging, Grad-CAM, Saliency Maps, Visual XAI, Clinical Trust, Deep Learning

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Photorealistic Face Rotation from Single-View Images: Methods and Future Directions

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Abstract

Face rotation is essential in many computer vision tasks, such as face recognition, expression analysis, and virtual reality. It allows for identity-conserving transformations of faces in different poses, enhancing the robustness of face-related AI systems.

Conventional face rotation techniques largely use geometric transforms and 3D model fitting algorithms. However, these have the tendency to perform poorly for highly posed, occluded, or texture-similar faces. In contrast, deep learning methods like Generative Adversarial Networks (GANs) and Neural Mesh Renderers have tremendously enhanced face rotation quality by abstracting complex spatial correspondence and photorealistic texture information. Methods like 3D Dense Face Alignment and Cycle-Consistent Adversarial Networks enhance identity preservation and facial fine details further.

Common test sets for measuring face rotation models include datasets like CelebA [4], 300W-LP [5], and Multi-PIE [6], which offer variant facial images over various views and lighting setups. These test sets enable measuring the model's robustness against variations in pose, expression, and consistency of identity.

While recent advances have been achieved, challenges remain in generalizing over extreme expressions, occlusion handling, and high-resolution texture synthesis. Generalization over a large set of face attributes, reducing artifacts, and real-time performance optimization for real-world applications in security, entertainment, and virtual reality are challenges that future work needs to tackle.

Key words: Face Rotation, Deep Learning, GANs, Neural Rendering, 3DMM

A Two-Stage GAN for High-Resolution Photo-Realistic Image Synthesis from Text

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Abstract

Synthesis of high-resolution photo-realistic images from text is a demanding task in artificial intelligence and deep learning. This work introduces a two-stage Generative Adversarial Network (GAN) approach to improve image quality and realism. A Character-level Convolutional Neural Network and Recurrent Neural Network (Char-CNN-RNN) is utilized in the first stage to perform effective text embedding, followed by a GAN that generates a coarse-resolution image. Another GAN is employed in the second stage to refine the generated image by adding fine details and textures. Adversarial loss ensures the model produces visually realistic and semantically coherent images. Experimental results validate that our method significantly enhances image fidelity and diversity compared to prior approaches.

Key words: Generative Adversarial Networks (GAN), Text-to-Image Synthesis, Char-CNN-RNN, High-Resolution Image Generation, Adversarial Learning, Deep Learning.

Feminist Reading of the Novel ‘*Those Pricey Thakur Girls*’ by Anuja Chauhan

Aawedita Patel and Roopa Philip*

Abstract

The ideology and movements in social, political, and cultural fields that strive to establish and achieve gender equality, with a focus on empowering women and challenging the discriminatory system of patriarchy, are known as Feminism. It promotes equal opportunities and rights for males and females in social, political, economic, and personal spheres. This paper explores the gender roles and family expectations through the lives of five Thakur-sisters and highlights how the novel portrays women, family, and gender roles in contemporary urban Indian society.

The feminist analysis shows how the idea of patriarchal family impacts the lives of characters and restricts their choices, particularly in terms of marriage, sexuality, and personal freedom. The Thakur family mentioned in the novel is a typical urban, upper-middle-class, patriarchal family, where the father expects his daughters to behave ‘appropriately’ and marry well.

The novel reflects the struggles of women, trying to live freely in a patriarchal society that has been constantly imposing restrictions on them. A feminist reading of the novel helps to understand how gender roles are imposed on females, and it also reveals the gender-based discrimination in Indian patriarchal society during the 1980s. The study further explores engagement of the novel with themes of women’s empowerment in a rapidly evolving Indian society by emphasising the acts of resistance, negotiation, and self-expression by female characters in the novel.

Key words: Patriarchy, Family, Society, Marriage, Female.

Evolving Voices of Pandemic Communication: Contrasting the 1896 Bubonic Plague and COVID-19 Social Media Landscape

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Abstract

This study conducts a comparative analysis of social media's distinct roles in pandemic communication during two significant health crises: the 1896 Bubonic Plague and the ongoing COVID-19 pandemic. By examining modes of information dissemination, public engagement, and societal responses in these two contexts, this research elucidates the evolution of crisis communication over time. The 1896 plague communication landscape was primarily defined by printed materials and oral transmission, characterized by slower propagation and limited reach. In contrast, the COVID-19 pandemic has been shaped profoundly by social media, facilitating instantaneous updates, citizen-driven reporting, and expansive global connectivity. This comparative perspective yields critical insights into optimizing pandemic communication strategies and strengthening societal resilience in future health emergencies.

Key words: Social media, Pandemic communication, 1896 Bubonic Plague crisis, COVID-19 pandemic, information dissemination, social connection, public response, crisis management, societal resilience.

A Study on Investor Psychology and Investment Decision-Making: A Systematic Literature Review Using the TCCM Framework

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Abstract

Traditional finance theories assume that investors are rational and make investment decisions based solely on available information and expected returns. However, empirical evidence suggests that investment decisions are significantly influenced by psychological and behavioural factors. This study aims to examine how investor psychology affects investment decision-making through a Systematic Literature Review (SLR) using the TCCM framework. The study is entirely based on secondary data collected from peer-reviewed journal articles published between 2010 and 2024 and sourced from academic databases such as Google Scholar, academia.edu. A structured SLR process was followed to ensure transparency and reliability, involving clearly defined search strategies and inclusion and exclusion criteria. The selected studies were analysed and systematically classified using the TCCM framework, which focuses on Theory, Context, Characteristics, and Methodology. The review indicates that Prospect Theory and Behavioural Finance Theory are the most commonly used theoretical foundations in explaining investor behaviour. In terms of context, the majority of studies focus on stock markets and retail investors, particularly in emerging economies. The analysis of investor characteristics reveals that psychological biases such as overconfidence, loss aversion, herd behaviour, and risk perception play a significant role in influencing investment decisions. Methodologically, the findings show a strong dominance of quantitative, survey-based approaches, with limited use of qualitative and experimental methods.

Key words: Investor Psychology, Investment Decisions, Behavioural Finance, Systematic Literature Review, TCCM Framework.

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A Study on the Implementation of Sustainable Supply Chain Practices in Food Processing and Agro-Based Indian Small and Medium Enterprises (SMEs)

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Abstract

The purpose of this study is to evaluate the implementation of sustainable supply chain practices in food processing and agro-based small and medium enterprises (SMEs). While sustainability has been widely studied in large organizations, limited attention has been given to its adoption in Small and Medium Enterprises, especially in the food processing sector. This study adopts a descriptive research method and is based entirely on secondary data collected from academic journals, industry reports, sustainability disclosures, and published literature.

The study analyses key sustainable supply chain practices such as green procurement, waste reduction, energy efficiency, and sustainable packaging, along with environmental cost considerations related to waste, energy, and packaging. The findings indicate that although food processing small and medium enterprises increasingly recognize the importance of sustainability, the extent of implementation remains limited due to financial constraints, lack of expertise, and limited technological support. The study concludes that effective sustainability strategies and increased awareness can significantly improve sustainable supply chain adoption in food processing Small and Medium Enterprises, thereby supporting long-term environmental and operational sustainability.

Key words: Sustainable Supply Chain Management, Food Processing SMEs, Environmental Cost Control, Sustainability Adoption, Agro-Based Enterprises.

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Decoding Generation Z's Shopping Behaviour: Key Insights for E-Retailers in Today's Digital Landscape

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Abstract

The study investigates the shopping habits of Generation Z consumers at specific online retailers. Understanding the factors that influence their engagement and loyalty is crucial for businesses aiming to effectively target this tech-savvy demographic in the advancement of digital technology and the significance of online shopping. Using a mixed-methods approach, including in-depth interviews and surveys, the research reveals that convenience, cost, product quality, brand reputation, and social media influence are significant drivers of Generation Z's online purchasing behaviour. Additionally, these consumers prioritize individualized experiences, social participation, and ethical considerations when selecting e-retailers. These findings carry important implications for e-retailers seeking to attract and retain Generation Z customers. By tailoring their marketing strategies and product offerings to align with the interests and motivations of this group, businesses can enhance their appeal. Generation Z values social interaction and personalized experiences, often seeking interactive elements that foster community and facilitate sharing. E-retailers that utilize data-driven personalization and encourage social engagement are more likely to resonate with this generation. Continued research is essential to uncover additional trends influencing Generation Z's purchasing decisions in the dynamic e-retail landscape. This ongoing study will aid e-retailers in adapting to the evolving preferences of this influential consumer group.

Key words: Generation Z, E-retailers, data driven personalization, brand recognition, social media participation, consumer expectation.

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