International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 01 | Jan - 2025 SJIF Rating: 8.448 ISSN: 2582-3930

# A SURVEY ON AI-CONTENT GENERATOR

Karthik KJ*[1], Sonu S Varghese*[2], Varun Shetty*[3], Yadhu Krishnan CS*[4], Linda Sebastian*[5],
College Of Engineering,Kidangoor
Kottayam,Kerala,India
[1] karthikkj131@gmail.com [2] sonusvarghese6@gmail.com [3] varunasus2023@gmail.com
[4] ykofficial.in@gmail.com [5] lindasebastian@ce-kgr.org

***ABSTRACT:*** *This survey provides an in-depth exploration of AI-driven content generation, covering key areas such as text creation, image synthesis, video generation, and automated coding. By examining advancements in technologies like Large Language Models (LLMs), GANs, and diffusion models, the study highlights AI's role in transforming diverse fields. Text generation technologies are enabling structured, creative, and conversational outputs, while image and video synthesis models like Imagen and Phenaki are setting new benchmarks for visual quality and realism. In code generation, tools like ChatGPT and GitHub Copilot showcase AI's ability to translate natural language into efficient, executable code.*

*The survey delves into the mechanisms underpinning these technologies, including transformer-based architectures, hierarchical modeling, and in-context learning. It also emphasizes their practical applications, from streamlining workflows and enhancing creativity to enabling non-experts to leverage sophisticated capabilities. While showcasing these innovations, the paper discusses limitations such as bias in data, high computational costs, and the need for greater contextual understanding in outputs.*

*By synthesizing current research and emerging challenges, this survey offers a comprehensive resource for researchers and practitioners. It underscores the transformative potential of AI in automating and enhancing content generation across domains, paving the way for future advancements in this rapidly evolving field.*

***INDEX TERMS:*** *AI Content Generators, Text Generation, Text-to-Image Synthesis, Text-to-Video Generation, Pre-trained Language Models, Natural Language Processing, Deep Learning, Automated Content Creation.*

## 1. INTRODUCTION

The rapid evolution of Artificial Intelligence (AI) has fundamentally changed how content is created, consumed, and distributed across industries. AI content generators, powered by advanced machine learning (ML) models and natural language processing (NLP), are now integral tools for producing dynamic, scalable, and high-quality content across formats such as text, images, videos, and source code. These technologies have proven transformative for marketers, educators, software developers, and content creators, streamlining workflows and enabling personalized, engaging content for diverse audiences.

AI-driven content generation builds on sophisticated architectures like transformer-based models, including GPT (Generative Pretrained Transformers) and BERT (Bidirectional Encoder Representations from Transformers), which excel at understanding language semantics and context. These models generate human-like text for applications ranging from blog posts and social media content to complex narratives and technical reports. In parallel, advancements in image and video generation, using models like DALL-E, Imagen, and CogVideo, leverage GANs and diffusion techniques to convert textual descriptions into photorealistic visuals or dynamic videos. Similarly, tools like ChatGPT and GitHub Copilot automate code generation, assisting developers by translating natural language into executable code, enhancing productivity and reducing errors.

Despite their remarkable capabilities, AI content generators face challenges. Maintaining originality, creativity, and ethical standards remains critical, as biases, misinformation, and computational resource demands can undermine their utility. Additionally, achieving deeper contextual understanding and human-like creativity in humour and emotion continues to be a barrier. These limitations highlight the need for continuous refinement and the incorporation of ethical frameworks to ensure responsible deployment.

This survey examines the core technologies driving AI content generation, exploring their practical applications across industries, including education, entertainment, and software development. By addressing the benefits, challenges, and future potential of these systems, this paper provides a comprehensive overview of how AI is reshaping content creation. It highlights innovations such as hierarchical modeling and in-context learning while emphasizing the importance of scalability, efficiency, and ethical considerations in AI-driven content generation. As these systems evolve, they promise to democratize access to high-quality content creation, enabling users with

varying expertise to harness AI's transformative power.

This work aims to guide researchers and practitioners by synthesizing advancements and identifying gaps in current technologies. By fostering innovation in scalable and ethical AI tools, this study underscores the critical role of AI content generators in shaping the future of content production, ensuring they remain impactful and aligned with the dynamic needs of global industries.

## 2.LITERATURE SURVEY

### 2.1 Text Generation

[1] AI text generation (AIGC) spans three primary areas: structured writing, creative writing, and dialogue writing, each with distinct applications and challenges. Structured writing is employed to generate factual content from structured data, such as news articles, where consistency and precision are essential. Creative writing, on the other hand, emphasizes personalization and originality, making it ideal for marketing materials, blogs, and social media posts that aim to engage and resonate with audiences. Dialogue writing, typically used in chatbots and virtual assistants, focuses on creating contextually accurate and relevant responses for interactive conversations, particularly in customer service settings. The underlying mechanism of AI text generation involves training large models, such as GPT, on extensive datasets to understand the relationships between words and context through deep learning methods. Once trained, the model predicts and generates new text based on given prompts, with post-processing steps refining the output to match specific requirements, ensuring coherence, creativity, or engagement. Figure 1 showcases AI's capability to revolutionize industries by automating the creation of diverse content, from factual reports to creative writing and dynamic dialogues.

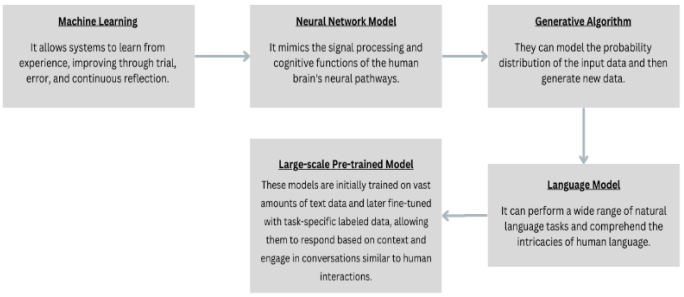


Figure 1: The evolution of AI models. [1]

[2] The study delves into the transformative capabilities of the pre-trained GPT-2 model for AI-based text generation, emphasizing its proficiency in producing contextually relevant and coherent content. As a transformer-based architecture, GPT-2 is trained on vast datasets to understand linguistic patterns and relationships, enabling it to predict subsequent words in a sequence. This functionality allows the model to generate human-like text effectively. Its versatility spans structured applications like content generation and creative domains such as storytelling or dialogue creation. Key findings highlight the importance of fine-tuning GPT-2 with domain-specific data to enhance coherence and relevance, particularly in long-form text outputs. While the model excels in delivering high-quality text, challenges persist in maintaining contextual consistency and addressing relevance across diverse scenarios. Additionally, issues such as occasional repetitiveness and difficulties in nuanced understanding underscore the need for further refinements. The paper underscores GPT-2's pivotal role in automating text creation across various fields, serving as a foundation for advancing generative AI. With continuous advancements and targeted improvements, models like GPT-2 have the potential to transform content creation, making it more efficient, scalable, and adaptive to specific industry needs, from marketing to education and conversational AI.

[3] The paper "Pre-trained Language Models for Text Generation: A Survey" extensively examines the groundbreaking role of pre-trained language models (PLMs) like GPT, BERT, and T5, which have revolutionized automated text generation. These advanced models utilize vast datasets to acquire a profound understanding of language semantics, syntax, and context, making them versatile tools for a wide range of applications, including machine translation, text summarization, creative writing, and dialogue systems. By encoding text into high-dimensional semantic representations and decoding them into coherent, contextually appropriate outputs, PLMs demonstrate exceptional performance in tackling complex linguistic tasks.

Despite their transformative capabilities, PLMs encounter challenges such as generating redundant or irrelevant content, difficulties in maintaining coherence over extended text, and biases rooted in their training data. These issues limit their reliability in scenarios demanding precision and fairness. The paper discusses several mitigation strategies, such as reinforcement learning to optimize decision-making, prompt engineering to align outputs with specific goals, and few-shot learning to improve adaptability in low-data settings. Additionally, iterative fine-tuning using domain-specific datasets enhances their contextual relevance and accuracy.

Ethical concerns form a significant part of the discussion, focusing on bias reduction, responsible deployment, and the transparency of generated content. The paper emphasizes the importance of integrating ethical safeguards into PLM design to ensure their outputs are fair, trustworthy, and free from harmful biases. It also underscores the need for collaboration among researchers

and developers to address these issues and foster responsible innovation.

Future directions for PLM development include enhancing computational efficiency, improving scalability, and increasing domain-specific adaptability to meet growing user demands. Advances in energy-efficient training techniques and modular architectures hold promise for overcoming current computational limitations. Furthermore, incorporating mechanisms to better capture deep context, subtle nuances, and diverse cultural perspectives will make PLMs more effective and inclusive. This paper not only highlights the capabilities and limitations of PLMs but also provides actionable insights and a roadmap for future research. By addressing existing challenges and fostering collaborative development, PLMs can pave the way for a transformative and inclusive AI-powered content creation ecosystem. Figure 2 helps to understand the flow and categorization of PLMs for text generation.

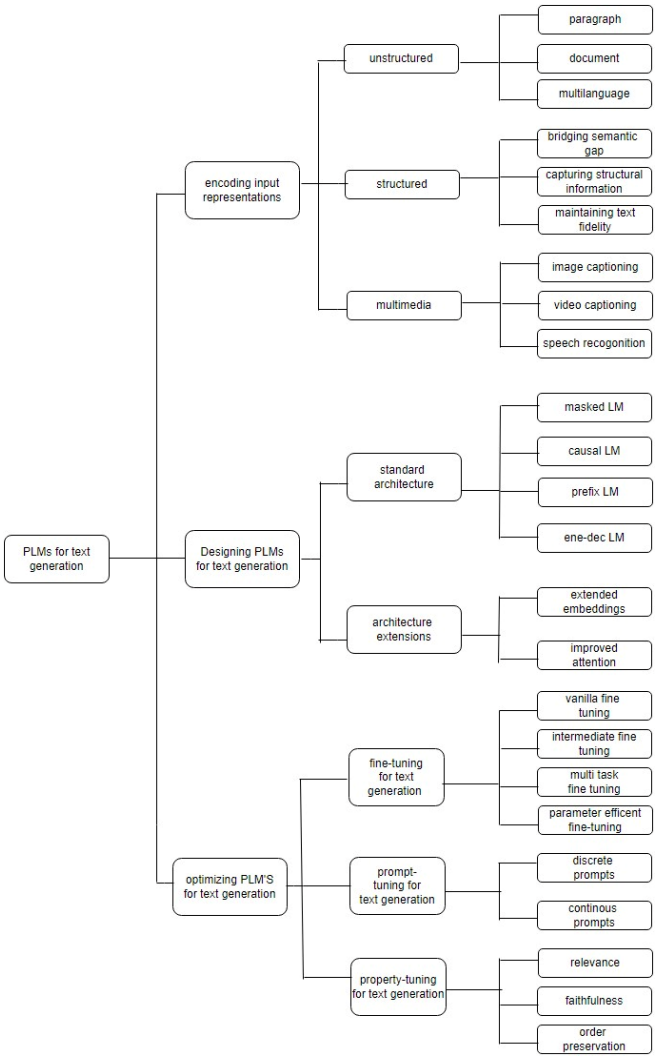


Figure 2: The main content flow and categorization. [3]

### 2.2 Image Generation

[4] The paper explores the progression of GAN-based text-to-image (TTI) generation models, detailing their underlying mechanisms, innovations, and challenges. At the core, GAN-based TTI models comprise a **Generator**, which synthesizes images based on textual descriptions and random noise, and a **Discriminator**, which evaluates the authenticity of generated images against real ones. Early models like StackGAN introduced a multi-stage approach to refine image resolution and fidelity, producing images progressively from lower (64×64) to higher (256×256) resolutions. StackGAN++ extended this with a three-stage hierarchical structure for enhanced realism and introduced conditional augmentation, combining text embeddings with noise to improve robustness and diversity. Later advancements, such as AttnGAN, incorporated attention mechanisms and the DAMSM model, enabling finer alignment between textual descriptions and image features at word and region levels. XMC-GAN refined this further by leveraging regional and global features through attentional self-modulation and contrastive losses, enhancing semantic consistency. Additionally, models like TAC-GAN introduced label-based diversity, enabling the generation of varied outputs from the same text input. While these GAN-based systems achieved significant strides in image-text alignment and diversity, limitations in handling complex descriptions and generating photorealistic results persisted, paving the way for diffusion models. Figure 3 highlight the role of iterative refinement, attention mechanisms, and semantic alignment in advancing TTI technology.

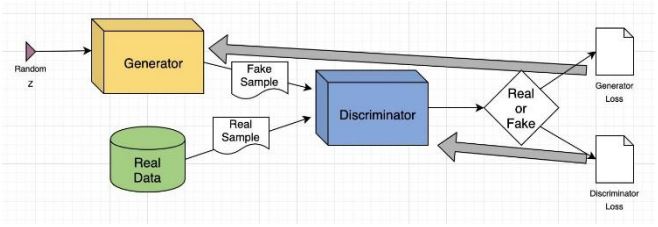


Figure 3: A general structure of GAN-based text-to-image generation models, where the Generator creates synthetic images from text descriptions to deceive the Discriminator, while the Discriminator distinguishes between real and generated images paired with authentic and fabricated text. [4]

[5] AI text-to-image generation represents a groundbreaking intersection of natural language processing and computer vision, enabling the transformation of textual descriptions into vivid images. Advanced models like CogView2, DALL-E 2, and Imagen showcase state-of-the-art methodologies that push the boundaries of generative AI, each excelling in distinct aspects of image synthesis.

**CogView2**, developed with a hierarchical transformer-based approach, is tailored for speed and quality. The model begins with low-resolution image creation, which is subsequently refined through a super-resolution module.

Its core innovation lies in the Cross-Modal General Language Model (CogLM), capable of processing textual and visual tokens using self-supervised learning. This enables CogView2 to generate highly aligned and contextually relevant images efficiently, addressing challenges in text-image correlation.

**DALL-E 2**, an innovation by OpenAI, employs a transformer with 175 billion parameters alongside the StyleGAN2 architecture. It translates text prompts into image tokens, reconstructing them into high-resolution visuals. This architecture allows DALL-E 2 to handle complex, nuanced prompts effectively, producing images that are both diverse and detailed. Its ability to interpret intricate textual descriptions sets a benchmark for creative generative tasks.

**Imagen**, created by Google, integrates the T5-XXL language model with diffusion models, delivering unparalleled photorealism. The model employs a progressive approach, starting with low-resolution images (64x64) and iteratively enhancing them to a stunning 1024x1024 resolution. This layered refinement ensures image fidelity, making Imagen a leader in generating lifelike and visually compelling outputs.

These models underline significant innovations in the field of generative AI. CogView2 optimizes speed without compromising quality, DALL-E 2 excels at managing intricate textual prompts, and Imagen sets new standards for photorealistic image generation. In conclusion, AI text-to-image generation exemplifies the seamless integration of natural language processing and computer vision, enabling the creation of vivid and contextually accurate visuals from textual descriptions. Models like CogView2, DALL-E 2, and Imagen represent the pinnacle of innovation in this domain, excelling in speed, detail, and photorealism. While CogView2 focuses on efficiency and alignment, DALL-E 2 thrives on handling intricate prompts, and Imagen sets benchmarks for fidelity and realism. Figure 4 shows the comparison of different AI text-to-image generators.

| Generator | Architecture | Training Data | Image Quality | Computational Requirements | Interpretability | Key Feature |
|---|---|---|---|---|---|---|
| CogView2 | Hierarchical transformer | Large text-only datasets | High resolution, better quality | Relatively efficient | Hard to interpret | Fast and efficient image generation |
| DALL-E 2 | Transformer with StyleGAN2 | Large image-text pairs | High quality, diverse images | High computational cost | Easy to interpret | Handles complex and diverse text prompts |
| Imagen | T5-XXL encoder with diffusion models | Large text-only corpora | Photorealistic, high-quality | Relatively efficient | Easy to interpret | Leverages language models for image generation |

Figure 4: AI text-to-image generators and their comparison [5]

### 2.3 Video Generation

[6] Long video generation is a rapidly advancing field in machine learning, focusing on creating videos of extended durations from trained models. One of the key challenges in this area is ensuring temporal consistency, maintaining high video quality, and managing the long-term dependencies between frames over time. These challenges require sophisticated techniques for generating coherent, visually appealing videos that capture the natural progression of scenes.

The paper identifies two main strategies used in addressing these challenges: divide-and-conquer and temporal autoregressive models. The divide-and-conquer method breaks down the video generation task into smaller, more manageable parts. It generates short segments or clips independently and then stitches them together to form a longer video. This approach simplifies the process and makes it easier to maintain video quality in smaller chunks, though ensuring smooth transitions across segments remains a challenge.

In contrast, temporal autoregressive models generate videos frame by frame, with each frame built on the preceding one. This method enables the model to maintain continuous motion and logical flow between frames, crucial for long videos. However, it can be computationally intensive since each frame must be generated sequentially, ensuring that the temporal relationships between frames are consistent throughout the video.

The paper highlights the significance of datasets like UCF101 and Kinetics, which provide essential video data for training models. It also underscores the importance of evaluation metrics to assess the quality of generated videos. These metrics focus on aspects such as visual fidelity, diversity, and temporal coherence, ensuring that the generated videos align with real-world expectations.

Emerging challenges include improving computational efficiency, dealing with diverse video content, and minimizing the resources required for training. Insights from this survey reveal the need for models capable of handling long-term dependencies, and the continued development of techniques for efficient, scalable video generation, paving the way for innovations in entertainment, virtual reality, and other creative industries. Figure 5 helps us to understand the Overview of Generation Paradigms.

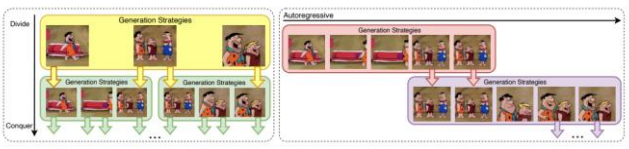


Figure 5: Overview of Generation Paradigms. The hierarchical generation process of the Divide and Conquer approach [6]

[7] AI text-to-video generators have made groundbreaking progress by incorporating sophisticated deep learning techniques, such as diffusion models and pre-trained

language models, to convert textual descriptions into high-quality videos. These innovations transform written prompts into detailed visual sequences, opening new possibilities in various industries, including entertainment, education, and content creation. For example, Make-A-Video enhances text-to-image diffusion models by adding spatiotemporal resolution techniques, ensuring high-definition and smooth video outputs. Imagen Video further refines this approach, using a T5 text encoder to enhance control over artistic styles and enabling 3D object comprehension for more dynamic video generation. Phenaki leverages its unique C-ViViT encoder-decoder architecture, which compresses video data into tokens to produce temporally consistent long-form videos. Models like CogVideo and GODIVA employ hierarchical training strategies and attention mechanisms to improve alignment between text and video, ensuring more accurate and coherent results. Additionally, NUWA utilizes 3D transformers for high-dimensional data processing, enabling the generation of complex and highly detailed video content.

Despite these advancements, challenges such as the high computational cost, dependency on large-scale datasets, and scalability issues remain obstacles. Addressing these challenges is crucial to making AI-driven video generation more accessible, efficient, and applicable to a wider range of industries. Future improvements should focus on optimizing computational efficiency, improving the models' adaptability across various domains, and expanding their generalizability to ensure their successful adoption in different use cases. As these models continue to evolve, they hold the potential to set new benchmarks in the field of video content generation, significantly enhancing creative workflows and transforming how content is created.

AI text-to-video generators are transforming content creation by generating high-quality videos from text. These models integrate deep learning techniques, offering flexibility in storytelling. Figure 6 highlights the advantages and limitations of different Ai text-to-video generators.

| Video Generator | Model Type | Advantages | Limitations |
|---|---|---|---|
| Make-A-Video | Text-to-Image model + unsupervised learning | Fast training, can use unlabeled video data, builds on image generation models | Struggles to connect text with specific video phenomena |
| Imagen Video | Video diffusion models | High-quality videos, diverse generation, 3D object handling, supports text animations | Issues with biased training data, social stereotypes |
| Phenaki | Encoder-decoder model with transformer | Good at video prediction, creates long videos based on text & starting frames | Trained on biased datasets |
| GODIVA | Text-to-video model with 3D sparse attention | Reduces computational cost, strong zero-shot ability | Hard to generate high-resolution long videos, challenging evaluation |
| CogVideo | Pretrained text-to-image model (CogView2) | Efficient use of image generation knowledge, better text-video alignment | Limited input length, large model size, GPU memory constraints |
| NUWA | Multimodal pretrained model with 3D transformer | Low computational complexity, strong zero-shot abilities | Poor text-video alignment in video frames |

Figure 6: AI text-to-video generator and their comparison [7]

### 2.4 Code Generation

[8] The paper examines the transformative impact of Large Language Models (LLMs) on automated code generation, focusing on their ability to convert natural language into executable source code. These models, including encoder-decoder and decoder-only architectures, excel in tasks like code generation, completion, and translation. By employing techniques such as multi-head self-attention and positional encoding, LLMs generate contextually accurate code. Features like in-context learning enhance their accuracy by integrating examples into prompts, while iterative refinement processes utilize feedback to improve reliability. Key contributions include a taxonomy detailing advancements in data curation, benchmarks, and ethical concerns. Prominent models such as Codex and GPT-4 are evaluated against datasets like HumanEval and MBPP, demonstrating their capability to solve diverse programming tasks with improved readability, efficiency, and correctness. These evaluations highlight LLMs' potential to streamline software development.

Despite notable advancements, challenges persist, including biases, high computational demands, and generalizability limitations. The paper also stresses the ethical implications, urging developers to address fairness and scalability concerns. Insights emphasize LLMs' ability to democratize programming, making it accessible to non-experts while enhancing developer productivity. This work provides a roadmap for developing scalable, ethical, and effective solutions for AI-driven code generation.

[9] This study evaluates the capabilities of AI-powered tools for code generation, focusing on ChatGPT and GitHub Copilot. Through a controlled experiment, the research measures the correctness and quality of code produced by these tools. The findings reveal that while both tools are proficient in generating correct code, ChatGPT outperforms Copilot in quality. Specifically, 98.52% of ChatGPT's generated lines adhered to coding standards, compared to Copilot's 64.7%. These results highlight the potential of such tools to streamline software development, reducing time and costs. However, the study also underscores the need for enhancements in generating consistently high-quality code to maximize their utility. By providing insights into the strengths and limitations of these tools, this research contributes to the ongoing development and refinement of AI in programming, paving the way for more reliable and efficient software engineering practices.

[10] The paper examines and evaluates the performance of three leading AI-assisted code generation tools: GitHub Copilot, Amazon CodeWhisperer, and ChatGPT. These tools were analyzed based on critical metrics such as code validity, correctness, security, reliability, and

| Category | Tool | Description |
|---|---|---|
| **Multi-purpose AI Tool** | | |
| | Copilot | Effective for document summarization, email drafting, data analysis in Excel, and integration with M365. |
| | ChatGPT | Superior conversational capabilities, strong coding support, comprehensive data analysis |
| | Llama | Creates images, content, or code |
| **Image Generation** | | |
| | DALL-E | Generates images from textual descriptions. |
| | MidJourney | Creates high-quality images from text prompts. |
| | Stable Diffusion | Open-source model that generates highly detailed images from text prompts. |
| **Text Generation** | | |
| | ChatGPT | Produces human-like text for various applications. |
| | Claude AI | Excels in understanding and generating human-like text, providing contextually appropriate responses. |
| | Jasper | AI writing assistant specializing in creating content for blogs, articles, and social media posts. |
| **Audio Generation** | | |
| | Descript | Provides tools for generating and editing audio content, including transcription. |
| | AVIA | Composes original music tracks using AI. |
| | Amper Music | An AI music composition tool designed for creating royalty-free music tracks for various media. |
| **Video Generation** | | |
| | Synthesia | Creates AI-generated videos featuring avatars, suitable for marketing and presentations. |
| | Pictory | Converts textual scripts into engaging video content. |
| | Lumen5 | AI-driven video creation tool that transforms blog posts and articles into engaging videos. |
| **Coding** | | |
| | GitHub Copilot | Assists with code completion, suggestions, and generating code snippets. |
| | Replit | Turns natural language into code. Aids in code generation and debugging across multiple programming languages. |
| | Tabnine | AI code completion tool that suggests code snippets and helps in writing code more efficiently. |
| **Academic Research** | | |
| | Zotero | Manages research sources, citations, and facilitates resource sharing. |
| | Research Rabbit | A free online tool uses AI to help researchers find relevant articles and authors and can be used for planning essays and literature reviews. |
| | Perplexity AI | Provides quick and accurate answers to user queries with sources and citations. |
| | Mendeley | Reference manager and academic social network that helps manage research, discover research data, and collaborate. |
| **Data Visualization** | | |
| | Tableau | Provides advanced tools for creating interactive data visualizations. |
| | DataRobot | Automates data preparation and model building processes for data science. |
| | Julius | Analyzes data with computational AI and chat with your files to get expert-level insights. |

maintainability using the HumanEval dataset, which provides a robust framework for evaluating programming solutions. The findings indicate that ChatGPT excels in code generation, producing correct code 65.2% of the time, surpassing GitHub Copilot (46.3%) and Amazon CodeWhisperer (31.1%). Moreover, the newer versions of GitHub Copilot and Amazon CodeWhisperer demonstrated improvement rates of 18% and 7%, respectively, reflecting ongoing advancements in these technologies.

A significant strength of ChatGPT lies in its ability to generate syntactically accurate and contextually relevant code across diverse tasks. It also benefits from a broader training dataset and superior language understanding capabilities, which contribute to its higher correctness rates. GitHub Copilot, on the other hand, integrates seamlessly into developer workflows, offering intuitive suggestions directly within code editors. Amazon CodeWhisperer demonstrates potential in specific domains but lags behind in overall performance metrics.

The study underscores the challenges faced by these tools, particularly in generating secure, maintainable, and high-quality code suitable for production environments. Issues such as logical errors, lack of comprehensive test case coverage, and vulnerability to biases in training datasets remain areas of concern. These limitations highlight the need for further refinement in their algorithms and datasets to improve generalizability and reliability.

The paper also emphasizes the transformative potential of these AI tools in reducing development time and costs. Their ability to assist developers in mundane or repetitive coding tasks allows professionals to focus on higher-level design and problem-solving. This shift in workflow can significantly enhance productivity, making software development more efficient and accessible.

Future work should focus on addressing existing challenges by incorporating advanced feedback mechanisms, better contextual understanding, and enhanced error correction capabilities. Ensuring robust testing of generated code to minimize vulnerabilities and improving support for diverse programming languages are also critical for their evolution. As these models mature, they are poised to become indispensable in the software development lifecycle, offering a blend of speed, accuracy, and innovation to meet the dynamic demands of the industry. AI-assisted code tools like ChatGPT, GitHub Copilot, and Amazon CodeWhisperer automate coding, with ChatGPT excelling in accuracy and quality. While these tools boost productivity, challenges like security and maintainability remain, requiring further refinement to meet evolving developer needs. Figure 7 shows the capabilities of different AI tools for different purposes.

Figure 7: AI tool comparison chart

## 3.CONCLUSION

In conclusion, this survey has delved deeply into the transformative potential of AI-driven content generation technologies, encompassing the realms of text, images, videos, and code. Leveraging advancements in transformer-based architectures, GANs, diffusion models, and LLMs, these systems have reshaped how content is created, consumed, and distributed. AI has demonstrated its ability to enhance productivity, creativity, and accessibility across diverse fields, including education, healthcare, entertainment, and software engineering. By automating complex tasks like text summarization, high-quality image synthesis, dynamic video generation, and precise code development, AI empowers individuals and organizations alike to achieve unprecedented efficiency.

However, challenges persist in improving content quality, contextual coherence, and ethical safeguards. Issues such as computational demands, bias mitigation, scalability, and adaptability to diverse domains highlight the complexities of AI deployment. Ethical concerns remain critical, especially regarding misinformation, intellectual property, and the responsible use of AI. Addressing these areas is essential for fostering trust and ensuring the widespread adoption of AI technologies.

Future advancements are expected to focus on refining AI systems for enhanced contextual understanding, real-time processing, and multi-language support. Innovations in computational efficiency, user-centric design, and ethical frameworks will further bridge the gap between current limitations and potential applications. The integration of personalized AI-driven solutions into industries such as marketing, customer support, education, and creative arts is likely to redefine content creation and consumption patterns globally.

This survey not only underscores the remarkable progress in AI content generation but also serves as a roadmap for future exploration. It emphasizes the importance of collaboration among researchers, practitioners, and policymakers to address current challenges while capitalizing on opportunities for scalable, ethical, and inclusive AI solutions. The continued evolution of AI promises to democratize content creation, fostering innovation and accessibility in a rapidly transforming digital landscape.

## 4.REFERENCES

[1] AI-Generated Content (AIGC): A Survey .Jiayang Wu, Wensheng Gan, Zefeng Chen, Shicheng Wan, and Hong Lin.

[2] Generative AI-Based Text Generation Methods Using Pre-Trained GPT 2 Model. Rohit Pandey , Hetvi Waghela, Sneha Rakshit , Aparna Rangari , Anjali Singh , Rahul Kumar , Ratnadeep Ghoshal , Jaydip Sen.

[3] Pre-trained Language Models for Text Generation: A Survey. Junyi Li, Tianyi Tang, Wayne Xin Zhao, Jian-Yun Nie, and Ji-Rong Wen. 2022.

[4] RenAIssance: A Survey into AI Text-to-Image Generation in the Era of Large Model Fengxiang Bie, Yibo Yang, Zhongzhu Zhou, Adam Ghanem, Minjia Zhang, Zhewei Yao, Xiaoxia Wu, Connor Holmes, Pareesa Golnari, David A. Clifton, Yuxiong He, Dacheng Tao, Shuaiwen Leon Song.

[5] A Survey of AI Text-to-Image and AI Text-toVideo Generators Aditi Singh

[6] A Survey on Long Video Generation: Challenges, Methods, and Prospects Chengxuan Li, Di Huang , Zeyu Lu , Yang Xiao, Qingqi Pei and Lei Bai

[7] A Survey of AI Text-to-Image and AI Text-toVideo Generators Aditi Singh

[8] A Survey on Large Language Models for Code Generation. Juyong Jiang, Fan Wang, Jiasi Shen, Sungju Kim, and Sunghun Kim. 2018.

[9] Hansson, Emilia, and Oliwer Ellréus. "Code Correctness and Quality in the Era of AI Code Generation - Examining ChatGPT and GitHub Copilot." Journal of Software Engineering, vol. 35, no. 2, 2024, pp. 112-128.

[10] Evaluating the Code Quality of AI-Assisted Code Generation Tools: An Empirical Study on GitHub Copilot, Amazon CodeWhisperer, and ChatGPT. Burak Yetiştiren · Işık Özsoy · Miray Ayerdem · Eray Tüzün