

# Poster Generation for Events Using Generative AI

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**Abstract**— The rapid advancement of generative artificial intelligence (AI) has unlocked new possibilities across various industries, particularly in creative design. One of the most promising applications is automated event poster creation, where AI-powered systems streamline the traditionally time-consuming design process. By leveraging techniques like Generative Adversarial Networks (GANs) and transformer-based models, AI can generate high-quality, visually appealing posters based on user inputs such as event details, themes, and branding preferences. This approach reduces reliance on human expertise while ensuring customization and personalization, making professional design accessible to individuals and businesses with limited resources. Our proposed system embeds generative AI into event management platforms which will aid in optimizing efficiency, scalability, and cost efficiency. As with any application, questions remain regarding issues of data bias, copyright, and user experience adjustments. Exciting trends will undoubtedly occur, with advances in AI-assisted trend analysis, dynamic video posters, and augmented reality (AR). Generative AI can automate and improve the poster creation process, and by doing so, it can assist in enhancing the event marketing process in more intelligent, intuitive, and inclusive ways.

## I.INTRODUCTION

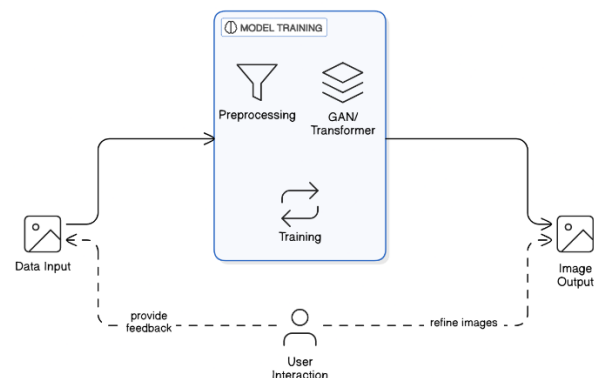
Designing promotional materials, such as posters, is an important part of any event management. In a traditional system, this is accomplished with experts or manual approaches, which are time consuming and costly. Generative AI offers some solutions, automatically generating posters and designs. This paper discusses the challenges to poster design posed by generative AI technologies and discusses a system for integrating these proposed methods into an event management system such as Nexus. Automating the creation of a poster helps streamline the workflow, and increases access to design tool for individuals without background in graphic design, allowing them to create professional quality promotional materials much quicker.

## II. BACKGROUND

### A. Generative AI Overview

Generative AI (Machine learning algorithms being designed to manufacture original content (text, image and video)) in name. Some examples of other more generative algorithm are (but not limited to) Variational Autoencoders,

Generative Adversarial networks and diffusion (they have been able to churn out pretty awesome-high quality media from hard to tell difference. In the case of GANs the generator and discriminator (or critic) work are trained on each other. The generator produces an image, and the discriminator learns to label the image(s) as (very) real or poor-man version of what it's "perceiving" (by contrasting the results of the generator with a continuous stream of real images) — This is thereafter replayed as in a generator vs model learning mode where the model gets better classifying previously unknown true' information on observed images. Example of Generative AI operating on top of this retooled transformer architecture is OpenAI, DALL-E exciting API



### B. Poster Design Challenges

Posting Aesthetics: Having the Right Amount of Text, Imagery and Design Balances Out a Poster. Graphic designers In former days had rules of typography, color and composition structures to yield results. Manual design: tedious, and hard accomplished, too.

Challenges include:

- Ensuring high-quality designs without extensive human intervention.
- Personalizing posters to reflect different themes and branding requirements.

- Reducing the cost of hiring professional designers while maintaining creativity.
- Generative AI addresses these issues by analyzing input data, generating customized templates, and refining outputs based on user preferences.,

### III. PROPOSED SYSTEM

#### A. System Architecture

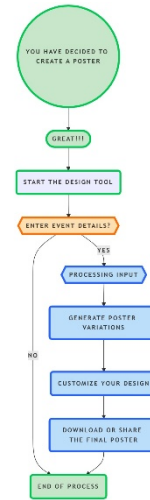
The proposed system contains the following components:

- Frontend: A user-friendly interface for users to input event details such as theme, date, and location.
- Backend: A generative AI model processes these inputs to generate poster designs. State-of-the-art models like DALL-E or Stable Diffusion can be employed.
- Database: Stores templates, user inputs, and generated outputs for future use or further refinement.

#### B. Workflow

1. User Input: Users enter event details, including title, date, venue, theme, and any additional elements such as images or logos.
2. Processing: The AI model processes the input using predefined design rules and generative algorithms.
3. Output Generation: The system generates multiple poster variations based on user input prompts.

4. Customization: Users can customize the design.
5. Download/Share: The final poster can be downloaded or shared directly to social media



#### C. System Integration

Automated Design Capabilities with Automated Design System- the potential for superior user experience can be achieved using a system that can be embedded into event platforms, mobile apps and/or web services with automated design system. The system could further layer the AI-driven recommendation engine with augmentation to the system with additional design recommendation suggestions based on what the user has selected in the past.

### IV. IMPLEMENTATION DETAILS

#### A. Model Training

Big data of poster designs, themes and styles is used to train the machine learning model or AI model. After this model is trained on the data using transfer learning, we will be using it for the design problem and want to fine-tune it. Next, we describe techniques of image augmentation to synthetically increase the variation in images (e.g., rotation, scaling, color perturbations to make the model robust).

#### B. Customization Features

- To improve user engagement, the platform offers customization features such as:
- Font selection: Users can choose from a variety of fonts.
- Color palettes: Customizable color schemes ensure branding consistency.
- Element positioning: Users can drag and resize elements for precise alignment.
- AI-based suggestions: Intelligent recommendations based on event type and industry trends.

### C. Quality Assurance

- To ensure high-quality poster outputs, the system implements:
- User feedback loops: Ratings and reviews help refine the AI model.
- Style adaptation: AI adapts based on user-selected design preferences.
- Automated error detection: Ensures readability and visual balance.

## V. BENEFITS

The proposed system offers several advantages, including:

- **Cost-Effective:** Reduces dependency on professional graphic designers, making poster design accessible to small businesses and individuals.
- **Efficiency:** Generates high-quality posters in seconds, significantly reducing turnaround time.
- **Scalability:** Capable of handling large-scale events by generating multiple poster designs rapidly.
- **Personalization:** Allows customization based on user preferences and event themes.
- **Consistency:** Ensures branding consistency across various promotional materials.

## VI. CHALLENGES AND FUTURE WORK

### A. Challenges

Despite its benefits, AI-driven poster generation faces several challenges:

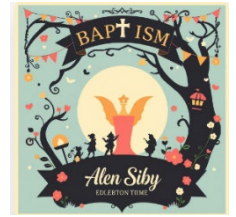
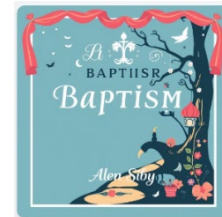
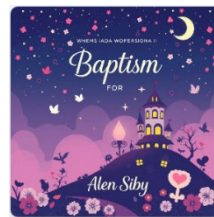
- **Data Bias:** Training datasets must be diverse to avoid biased outputs.
- **User Experience:** Ensuring the platform remains intuitive for non-technical users.
- **Copyright Issues:** Generated content must comply with copyright regulations.
- **Hardware Constraints:** Processing high-resolution images requires significant computational power.

### B. Future Enhancements

- **Video Posters:** Expanding capabilities to generate dynamic video-based posters.
- **Augmented Reality (AR) Integration:** Creating interactive posters for modern event marketing.
- **Cross-Platform Support:** Enabling poster generation across web and mobile platforms.
- **AI-Powered Trend Analysis:** Identifying design trends to generate contemporary and visually appealing posters.

## VII. CASE STUDIES

To ascertain the proposed system, scenarios can be based on fictitious situations that would demonstrate the ability of the AI-generated posters to produce numerous design sets that could be deemed multiple and effective. This could include a wedding poster, conference poster, and music festival poster to show the use of the system for a collection of topics and requirements. A design can also be validated as effective based on user testing responses and/or A/B testing..



## VIII. CONCLUSION

Generative AI has significant potential to transform event administration with the automation of poster design. This technology simplifies and accelerates the design process, while also providing everyone access to professional, high-quality design work. Providing generative AI functionality in a platform such as Nexus will ensure that event organizers are not only saving money and time, yet they will also have the ability to create customized solutions for their promotional materials.

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