

# Illuma

## (Your Group Photo Revolution)

Suyash Panchal  
Information Technology  
Acropolis Institute of Technology  
& Research  
Indore, India  
Thesuyashpanchal@gmail.com

Shubham Vishwakarma  
Information Technology  
Acropolis Institute of Technology  
& Research  
Indore, India  
vishwshubham62@gmail.com

Yash Chordiya  
Information Technology  
Acropolis Institute of Technology  
& Research  
Indore, India  
yashchordiya1@gmail.com

Shivanshu Soni  
Information Technology  
Acropolis Institute of Technology  
& Research  
Indore, India  
sshivanshu465@gmail.com

**Abstract—** Illuma is an AI-powered platform designed to transform how users interact with data and visual content. By utilizing machine learning and data analytics, Illuma provides intelligent data analysis, customizable visual interfaces, and seamless integration with digital ecosystems. The platform helps users make informed decisions, optimize workflows, and enhance user experiences across various industries, with a focus on scalability and ease of use.

### I. INTRODUCTION

Photography has become an integral part of modern life, with people constantly documenting their lives through photos—whether during family gatherings, social events, or trips with friends. However, one significant problem persists: the photographer is often left out of the group photo. This issue can seem trivial but is quite disruptive when it comes to capturing memories where everyone is supposed to be included. Whether it's a spontaneous family gathering or a vacation photo at a scenic location, the photographer is often excluded, unless they resort to using selfie sticks or asking a stranger for assistance.

Illuma, a cutting-edge mobile and web application, aims to solve this problem by using artificial intelligence (AI) and image processing techniques to seamlessly integrate the photographer into group photos. The core functionality of Illuma revolves around taking two photos—one with the group and another with the photographer—and using AI to merge them into a single, cohesive image. By automating this process, Illuma ensures that the final picture looks as though everyone was present at the same time, with no artificial blending or awkward overlaps.

### II. PURPOSE

First, The primary purpose of Illuma is to make group photography inclusive, ensuring that no one is left behind in the picture, not even the person taking it. In an era where photography plays a vital role in our personal and social lives, Illuma bridges the gap between technology and everyday use cases, making it easier than ever to create perfect group photos without additional tools like tripods, timers, or selfie sticks.

Traditional methods for capturing group photos often disrupt the moment. For example, when using timers, people may rush to get into position, causing the natural flow of the

photo to be lost. Asking a passerby to take the photo can also lead to suboptimal results, with the photographer's preferences regarding framing or lighting being overlooked. Illuma eliminates these issues by allowing users to capture memories effortlessly, while maintaining full control over the process.

The purpose of Illuma extends beyond photography—it's about enhancing the experience of preserving memories. By offering an intuitive and effective solution, Illuma ensures that all participants in a group can be part of the memory, without compromising on quality or convenience.

### III. LITERATURE SURVEY

#### I. Existing Problem

The problem of excluding the photographer from group photos is a longstanding one, with several attempted solutions over the years. Traditional methods of group photography include the use of timers, selfie sticks, and tripods, but these have significant limitations:

- **Timers:** Cameras with timers allow the photographer to be included in the picture by setting a countdown. However, this method often results in rushed photos, with people scrambling to get into place before the timer goes off. Moreover, the lack of control over framing and composition can result in poorly captured photos.

- **Selfie Sticks:** A popular solution in recent years, selfie sticks allow the photographer to include themselves in the photo by extending the camera's reach. However, selfie sticks often result in unnatural framing, limited angles, and awkward compositions. Additionally, the presence of the stick in the photo can be distracting, leading to less polished results.

- **Tripods:** Using a tripod allows the photographer to set the camera in a fixed position and join the group for the photo. While this solves the problem of framing, it requires the photographer to carry additional equipment, which is cumbersome for casual outings or spontaneous moments. Moreover, tripods are impractical for crowded or tight spaces.

- **Asking Strangers:** One of the most common solutions is to ask a passerby to take the photo. While this allows the photographer to be included, it introduces the risk of poor framing, incorrect focus, or simply not capturing the moment as intended. Additionally, in some situations, handing

over one's camera or phone to a stranger can pose a security risk.

- **Manual Editing:** For those with access to photo editing software like Photoshop, manual editing allows the photographer to merge themselves into the group photo. However, this process is labour-intensive, time-consuming, and requires a high level of technical expertise. Even with skilled editing, the final image may not appear natural, as achieving seamless blending between two images is challenging without professional tools.

These traditional methods have failed to provide a simple, effective, and high-quality solution for including the photographer in group photos. This gap in the market creates an opportunity for a new approach, one that leverages modern technology to automate the process while delivering professional results.

#### IV. Literature Review

Summary of Solutions/Systems already available that are addressing the same issue/problem. (prepare a table of such solutions )

| SR. NO | Name of Solution/System  | Feature           | Limitations/ Drawbacks               |
|--------|--------------------------|-------------------|--------------------------------------|
| 1      | Google's Add Me Feature  | Blending images   | It superimposes two images sometimes |
| 2      | Adobe AI Image Generator | Generate s images | Image generation is not accurate     |

Table.1 current Available Solutio

#### II. Proposed Solution

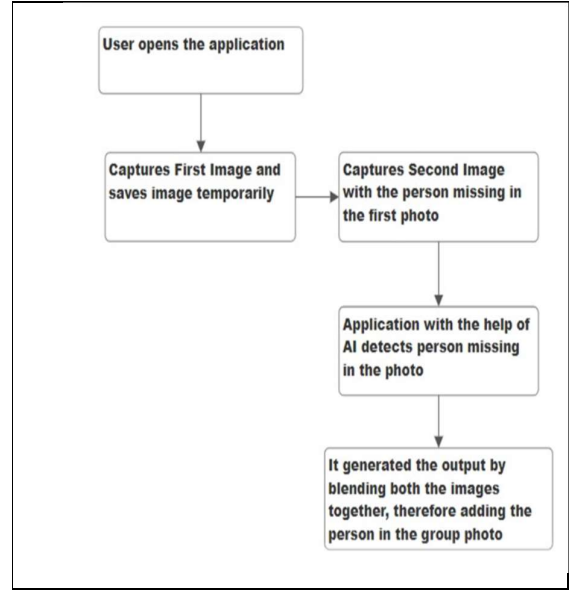
Illuma offers an innovative, AI-driven solution to this problem. By taking two photos—one of the group and another with the photographer—the application intelligently merges the two images into one, creating a final group photo where everyone is included. The merging process is made possible through the use of several advanced techniques:

- **Image Acquisition:** The user takes two photos from the same angle—one with the group and another with the photographer. This ensures that the background and lighting remain consistent across both images.
- **Image Alignment:** Illuma uses AI algorithms such as SIFT (Scale-Invariant Feature Transform) or ORB (Oriented FAST and Rotated BRIEF) to detect key features in both images. By identifying and matching these features, the application aligns the two photos, ensuring that the perspective and scale are consistent.
- **Object Detection and Segmentation:** The application employs deep learning models, such as Mask RCNN, to detect and segment the people in the photo from the background. This allows Illuma to isolate individuals and ensure that only the necessary parts of each image are merged.
- **Image Blending:** Using techniques like alpha blending or Poisson image editing, Illuma merges the two images into one. These techniques ensure that the transition between the two photos is smooth and that the final image looks cohesive. The AI adjusts for factors such as lighting, shadows, and color balance, making the final image appear as though it was captured in a single shot.

- **Fine Tuning:** Illuma's AI also addresses edge cases, such as overlapping areas where individuals may obscure one another. The application automatically corrects for such issues, ensuring that the final image looks natural and polished.

By automating these complex processes, Illuma makes it easy for users to create perfect group photos with minimal effort. The proposed solution is not only efficient but also ensures high-quality results, making it accessible to users with little to no technical expertise.

#### V. Flow Of Project



#### VI. Applictaion

- The Illuma application has a wide array of potential applications across various sectors and user demographics. Below are some of the key areas where this solution can be applied:
- **Social Events:** Whether it's a birthday party, wedding, or casual get-together, Illuma enables participants to include themselves in group photos without the need for external assistance.
- **Travel and Adventure Photography:** Travelers often encounter stunning landscapes and iconic landmarks, and Illuma enables them to be part of the experience without cumbersome equipment. With the application, travelers can easily capture memories with their companions, creating lasting souvenirs of their adventures.
- **Corporate and Professional Settings:** In professional environments, Illuma can facilitate the capture of team photos, conference memories, and corporate events. By including the photographer in the image, organizations can create a complete representation of their teams during important milestones, enhancing workplace culture and morale.
- **Content Creation and Influencer Marketing:** Content creators and influencers can leverage Illuma to produce high-quality group photos for their social media platforms. The seamless integration of the photographer into group shots saves time and effort,

allowing creators to focus on content strategy rather than logistical challenges.

- **Event Photography Services:** Professional photographers can use Illuma as an additional service offering, enhancing their portfolio by providing clients with unique group photos that include the photographer. This can differentiate their services in a competitive market, attracting more clients looking for innovative solutions.
- **Virtual Events:** In the era of remote interactions, Illuma can be adapted for virtual events.

Through these diverse applications, Illuma addresses a common problem while providing innovative solutions that enhance the photography experience. The potential to integrate this technology into various sectors demonstrates its versatility and relevance in today's visual-centric society.

#### REFERENCES

- [1] A. Sarkar, A. Goyal, D. Hicks, D. Sarkar and S. Hazra, "Android Application Development: A Brief Overview of Android Platforms and Evolution of Security Systems," 2019 Third International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), Palladam, India, 2019, pp. 73-79, doi: 10.1109/I-SMAC47947.2019.9032440. keywords: {Smart phones; Androids; Humanoid robots; Security; Java; Kernel; Android architecture; Cross-platform approaches; Android security},
- [2] Android Studio Official Documentation, <https://developer.android.com/studio>.
- [3] Dr. S. Balasubramanian, Facial Recognition Using Artificial Intelligence (AI)- Critical Analysis an Review, International Journal of Graphics and Multimedia (IJGM) 10(1), 2023, pp. 1-6. <https://iaeme.com/Home/issue/IJGM?Volume=10&Issue=1>. DOI: <https://doi.org/10.17605/OSF.IO/7MXU8>.
- [4] Flutter Official Documentation, <https://flutter.dev/docs>.
- [5] J. Liu and J. Yu, "Research on Development of Android Applications," 2011 4th International Conference on Intelligent Networks and Intelligent Systems, Kuming, China, 2011, pp. 69-72, doi: 10.1109/ICINIS.2011.40. keywords: {Smart phones;Androids;Humanoid robots;Virtual machining;Operating systems;Java;Receivers;Linux kernel;Android system;Application framework;Dalvik virtual machine},
- [6] Lancaster, T. Artificial intelligence, text generation tools and ChatGPT – does digital watermarking offer a solution?. Int J Educ Integr 19, 10 (2023). <https://doi.org/10.1007/s40979-023-00131-6>.
- [7] S. Kaneda and C. Premachandra, "AI Based Object Recognition Performance between General Camera and Omnidirectional Camera Images," 2022 2nd International Conference on Image Processing and Robotics (ICIPRob), Colombo, Sri Lanka, 2022, pp. 1-5, doi: 10.1109/ICIPRob54042.2022.9798740. keywords: {Image recognition;Machine learning algorithms;Robot vision systems;Machine learning;Object detection;Cameras;Object recognition;Omnidirectional camera;Object detection;Machine learning;YOLO;Recognition comparison},
- [8] T. P. Jacob, A. Pravin and R. Rajakumar, "An AI-Powered Smart Camera for Object Detection," 2021 6th International Conference on Communication and Electronics Systems (ICES), Coimbatre, India, 2021, pp. 1701-1703, doi: 10.1109/ICES51350.2021.9489064. keywords: {Face recognition;Smart cameras;Receivers;Object detection;Object recognition;Artificial intelligence;Lenses;HuskyLens;LoRa Module;MatchX Module;Color Detection;UART;Tag Detection}.