**BALA (slide 1-4)**

Hello everyone! I'm Bala Yashaswini, and I'm thrilled to introduce our team, imageINTELLECT. Our team comprises three dedicated members: myself, Manvi Tandon, and Naman Agarwal. Today, we're here to shed light on a crucial topic: improving deepfake detection using deep learning.

In today's world, it's crucial to understand the risks of deep fakes and that’s why we are taking the initiative to make a project to handle these uprising situations. Telling about the challenges deep fake has created like :

1. Misinformation Threat: Deepfakes can deceive people by making them believe false events or statements. This can lead to confusion, distrust, and even harm to individuals and society.
2. Privacy Concerns: Deepfakes can be used to create fake videos or images without someone's consent, potentially damaging their reputation or causing emotional distress.
3. Media Trust: With the rise of deepfakes, it's harder to trust what we see online. Projects detecting deep fakes help maintain trust in digital media by flagging manipulated content.

So, Deepfakes are artificial media, usually images or videos, created using deep learning techniques. They're so realistic that they can convincingly depict people saying or doing things they never actually did. This technology poses a serious threat as it can spread misinformation and manipulate public opinion.

For this project, we curated two main datasets for our project. The first dataset, faces\_\_224, contains images from the Kaggle deepfake-detection challenge. Each image has a resolution of 224 x 224 pixels, making it suitable for analysis. The second dataset, metadata.csv, provides additional information that helps us understand and categorize the images better.

**MANVI (slide 5 – 7)**

Hi, I'm Manvi Tandon, and let me tell you about the solution approach for our project. We're leveraging cutting-edge technologies like convolutional neural networks (CNNs) and Generative Adversarial Networks (GANs) to combat deepfakes effectively.

Firstly, we have developed a custom CNN architecture tailored specifically for deep fake detection. We meticulously pre-processed and normalized our dataset to ensure optimal model training. Visualizing the training images helped us gain valuable insights into the dataset's characteristics, enhancing our model's accuracy.

Next, we integrated GANs into our custom CNN framework to further enhance detection accuracy. By engineering a dual-module system comprising a generator and discriminator, we can effectively discern authenticity from fake images. GANs play a crucial role in refining feature extraction and improving the discernibility of manipulated content. Talking about how we combined both of them First up, we created the class generator using ReLU and tanh activation functions, ensuring the best accuracy. By leveraging the momentum with both CNN and batch normalization, we achieved remarkable results. We did the same with the discriminator class but used leaky ReLU and sigmoid activation functions because sigmoid provides clarity in defining the images, leading to exceptional accuracy in identifying deepfakes.

Lastly, we conducted a comparative analysis between two prominent GAN architectures: Bicyclic GAN and Deep GAN. This evaluation helped us understand the strengths and limitations of each type in discerning fake from real images based on distinctive features. It ensures transparency and accountability in our deepfake detection process.

**NAMAN (slide 8-11)**

Hi, I'm Naman Agarwal and now let's talk about our contributions. Bala focused on researching GAN models and their types, ensuring we utilized the most effective techniques in our project, whereas Manvi played a significant role in researching literature, especially during the initial phases of our project, and handled data collection and preprocessing, ensuring our datasets are robust and reliable. As for me, I contributed to the literature survey, delving deep into existing research to inform our project decisions. I also led the development of our custom CNN architecture, ensuring it meets the specific requirements of deepfake detection.

In conclusion, our project has made significant strides in improving deepfake detection using deep learning techniques. By leveraging advanced technologies like GANs and custom CNN architectures, we can now identify fake images with greater accuracy and reliability.

Our collaborative efforts have led to a robust solution that preserves trust in digital media integrity and helps combat the spread of misinformation.

With the ability to distinguish between authentic and manipulated content, we're one step closer to safeguarding the authenticity of digital media in today's era of rampant misinformation.