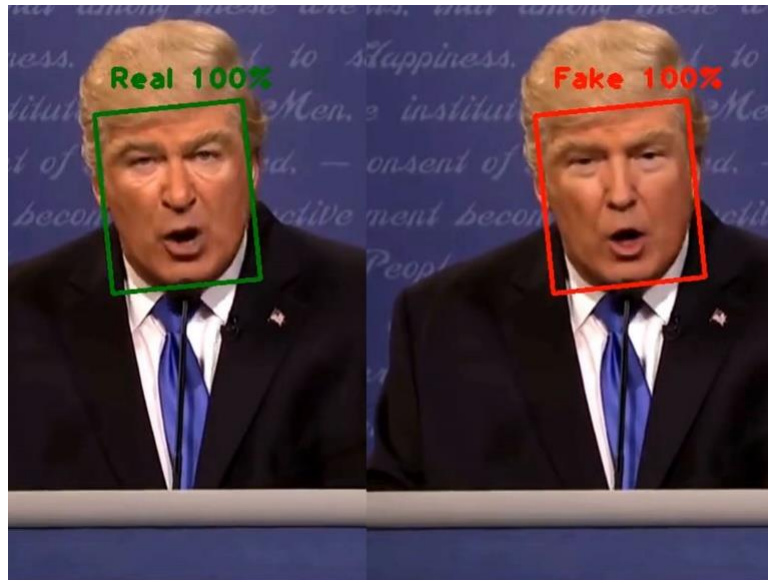# Title: **Face-Forensics: Deepfake endangering the Cybersecurity**

Motivation:

Deepfake is an AI-based technology used to create or alter images, audio, and video resulting in synthetic content that appears authentic. In recent time, we get some videos in which faces have swapped using Machine Learning and Deep Neural Networks. Situations are not perceived objectively, leading to misjudgments and false information. Deepfakes are going to wreak havoc on society.

Objective:

The main objective of this project is protect against Deepfake image or videos. Secure our system against anti-fake technology.

Critical Challenges:

It is very much difficult analyse the facial mannerisms and expressions and see how they are unique to each individual.

How Ps are addressed through the project and mapping among Ps, COs and POs

Ps	Attribute	How Ps are addressed through the project
P1	Depth of Knowledge Requirement	• The project requires study of research on Deep Learning system mainly generative adversarial networks (GAN), Digital Image processing **(K8)** • data collection from user site like Online Newspaper, Social- media, etc.**(K7)** • engineering design (multi-layer model design) **(K5)** and development **(K6)** • knowledge of software engineering and image processing **(K3, K4)**
P2	Range of Conflicting Requirement	Create an appropriate ML model to detect fake image from very low quality or high definition HD+ image or video.

P3	Depth of Analysis Required	Use generative adversarial network (GAN) a type of machine learning system instead of tensor-flow based deep-fakes.
P4	Familiarity of Issues	To detect more than 1080P (1920×1080 pixels) fake image, image-processing time is so difficult.
P5	Extent of applicable codes	Generate proper solution of machine learning model based on generative adversarial network.
P7	Interdependence	Creating Model (algorithmic part), Classify image characteristic.

Addressing Complex Activities (As) through the project

As	Attribute	How As are addressed through the project
A1	Range of Resources	In development stage, the project requires the use of diverse resources including different type of **material (image), Information's**: images **meta-data** (real and fake), **technologies**: API (like, FF++), **people:** Developers.
A2	Level of interaction	By using ML model analyse the facial mannerisms and expressions, detect fake image from very low quality or high definition HD+ image or video.
A3	innovation	A degree of innovation is needed to develop the machine-learning based generative adversarial networks model using the available data set.
A4	Consequences for society and the environment	By detecting deep-fakes and disinformation, it is easy to distinguish between real and fake media. If we can detect the fake image or image related information to make it viral that can stop bad consequences for our society.
A5	Familiarity	The project deals with cybersecurity based on deep-fake analysis for students.

CO-PO mapping for this project

CO No.	CO(Project) Statements: Upon successful completion of the course, students should be able to:	Corresponding POs (Appendix-1)
CO1	**Explain** key issues and solutions of detect deep- fake image and video.	1,2, 3,12
CO2	**Use** industrial state of the practice methods of verifying and validating detecting accuracy.	4
CO3	**Use** a modern/popular IDE (Python language based)	5
CO4	**Understand** concept of professional ethics, confidentiality, industrial standards, risk benefit analysis and explain the impact of	6,7,8

	engineering solutions in social safety, data safety, and welfare	
CO5	**Maintain** distributed and collaborative software development, maintenance.	9,10,11

Appendix-1:
Washington Accord Program Outcomes (PO) for engineering programs:

No.	PO	Differentiating Characteristic
1	Engineering Knowledge	Breadth and depth of education and type of knowledge, both theoretical and practical
2	Problem Analysis	Complexity of analysis
3	Design/ development of solutions	Breadth and uniqueness of engineering problems i.e. the extent to which problems are original and to which solutions have previously been identified or codified
4	Investigation	Breadth and depth of investigation and experimentation
5	Modern Tool Usage	Level of understanding of the appropriateness of the tool
6	The Engineer and Society	Level of knowledge and responsibility
7	Environment and Sustainability	Type of solutions.
8	Ethics	Understanding and level of practice
9	Individual and Team work	Role in and diversity of team
10	Communication	Level of communication according to type of activities performed
11	Project Management and Finance	Level of management required for differing types of activity
12	Lifelong learning	Preparation for and depth of Continuing learning.