Information Technology

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TECH VIVIDS

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PRINCIPAL'S MESSAGE

Dear Parents and Students,

It is with great pleasure that I welcome you to our College (DIET) Newsletter. As Principal I am hugely impressed by the commitment of the college and the staff in providing an excellent all-round education for our students with our state of the art facilities. We, as a team working together, strongly promote the zeal towards academic achievement among our students. The cultural, sporting, and other successes of all our students and staff are also proudly celebrated together.

I congratulate the staff and students who brought the latest technologies and concepts onto the day-to-day teaching-learning platform. As long as our ideas are expressed and thoughts kindled we can be sure of learning, as everything begins with an idea.

I appreciate every student who shared the joy of participation in co-curricular and extracurricular activities along with their commitment to the curriculum. That little extra we do is the icing on the cake. 'Do more than belong – participate. Do more than care – help. Do more than believing – practice. Do more than be fair – be kind. Do more than forgive – forget. Do more than dream – work.'

With a long and rewarding history of achievement in education behind us, our DIET community continues to move forward together with confidence, pride, and enthusiasm. I hope you enjoy your visit to the website and should you wish to contact us, please find details at the www.diet.ac.in

Yours in Education

Dr.Ravi Kadiyala,

Principal

HOD'S MESSAGE

It gives me a great pleasure to congratulate the staff and students of the Department of IT for the first publication of the newsletter "Tech Vivids-Insights of IT". This newsletter mirrors the professional and academic achievements of faculty and students which would lead them to the overall development of their personality in the globalised world. Our effort would definitely create an impact in the minds of readers, by providing larger visibility and dimension. "Perseverance will always lead to diligence", with this in mind the department aims at quality teaching by exploring divergent events. The department motivates the students to improve their knowledge by organizing events like "DIG-Dhanekula IT GATE Hub", "IT Coding Warriors" etc. This is only a small step towards a long journey to achieve progress. On our way towards reaching the objectives we may have face numerous milestones. I hope "Tech Vivids- Insights of IT" would enlighten us with hope, confidence and faith in the journey ahead...... I congratulate the editorial board for the publication of the newsletter.

Dr.K.Sowmya
Professor& HOD
Dept. of IT

STUDENT ARTICLES:

PILL CAMERA

Capsule endoscopy is a procedure that involves swallowing a small capsule, which is the size of A large vitamin pill. Inside the capsule is a tiny A wireless camera that takes pictures as it passes through the Small Intestine. Images are transmitted to a recording device worn on the belt around your waist.
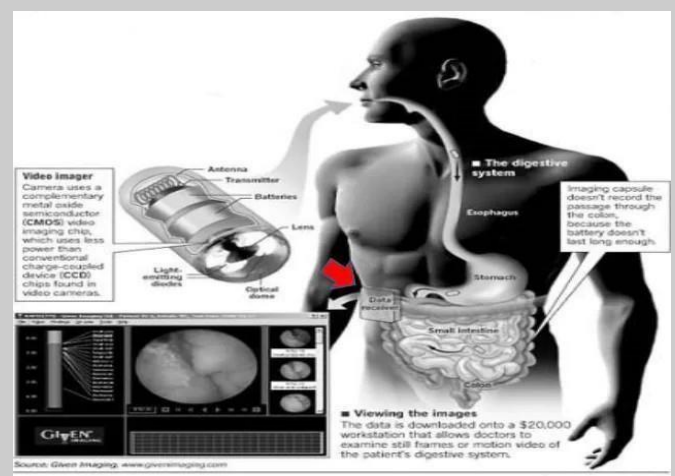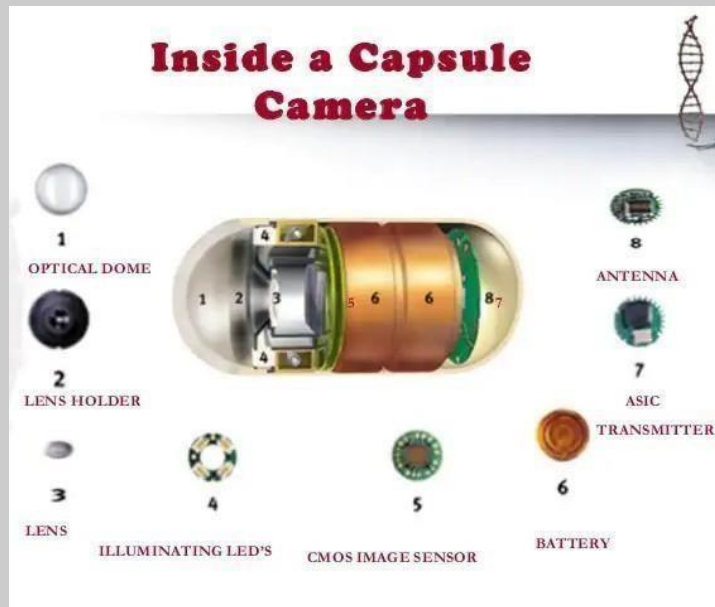

Conventional Method
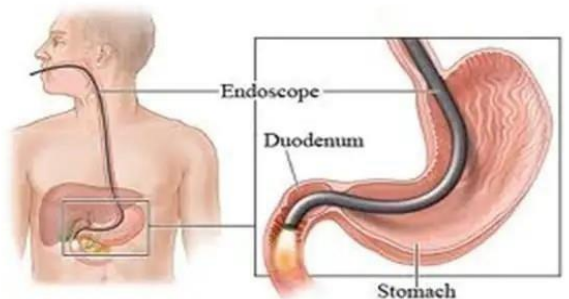
Endoscopic Procedure of EUS Endoscopy

The latest pill camera is sized at 26*11 mm and is capable of transmitting 50,000 images during its traversal through the digestive System of a patient.

How does a Pill Camera work?

Pill Camera procedure capsule is swallowed by the patient like a conventional pill. It takes images as it is propelled forward by peristalsis. A wireless recorder, worn on a belt by the patient, receives the images transmitted by the pill. A computer workstation processes the data and produces continuous still Images.

Inside a Capsule Camera

1. OPTICAL DOME
2. LENS HOLDER
3. LENS
4. ILLUMINATING LED'S
5. CMOS IMAGE SENSOR
6. BATTERY
7. ASIC TRANSMITTER
8. ANTENNA

Inside a Capsule:

1. Optical Dome
2. Lens Holder
3. Lens
4. Illuminating LEDs
5. CMOS Image Sensor
6. Battery
7. ASIC Transmitter
8. Antenna

Drawbacks:

- Patients with gastrointestinal structures or narrowing are not good candidates for this procedure due to the risk of obstruction.
- Patients with pacemakers, pregnant women face difficulties.
- It is very expensive and not reusable.
- Impossible to control Camera behavior.
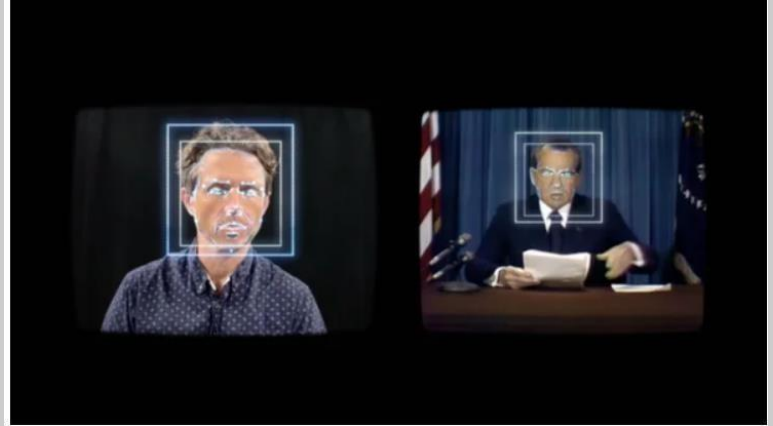- It cannot be used to take biopsies.

Advantages:

- Painless, with no side effects or complications and avoids the risk of sedation.
- Miniature size so can move easily through the digestive system.
- Accurate, precise, and effective.
- Images taken are of very high quality which is sent almost instantaneously to the data recorder for storage.
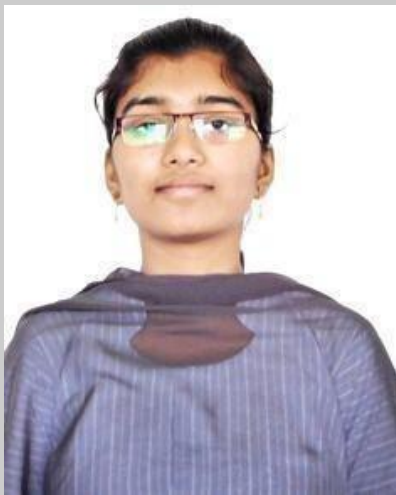
By- A.SIRISHA (198T1A1202)

Deep fakes and the New AI-Generated Fake Media Creation-Detection Arms Race

Manipulated videos are getting more sophisticated all the time—but so are the techniques that can identify them. Falsified videos created by AI—in particular, by deep neural networks (DNNs)—are a recent twist to the disconcerting problem of online disinformation. Although fabrication and manipulation of digital images and videos are not new, the rapid development of AI technology in recent years has made the process to create convincing fake videos much easier and faster. AI generated fake videos first caught the public#39;s attention in late 2017, when a Re edit account with the name Deep fakes posted pornographic videos generated with a DNN- based face-swapping algorithm. Subsequently, the term deep fake has been used more broadly to refer to all types of AI-generated impersonating videos.

DEEP FAKE VIDEO GENERATION

Step 1: The image region showing Brie's face is extracted from an original frame of the video. This image is then used as input to a deep neural network (DNN), a technique from the domain of machine learning and artificial intelligence..

Step 2: The DNN automatically generates a matching image showing Carrey instead Brie.

Step 3: This generated face is inserted into the original reference image to create the deep fake. The main technology for creating deep fakes is deep learning, a machine learning method used to train deep neural networks (DNNs). Deep Fakes are commonly created using a specific deep network architecture known as auto encoder. Auto encoders consist of three subparts: I) an encoder (recognizing key features of an input face) II) a latent space (representing the face as a compressed version) III) a decoder (reconstructing the input image with all detail)

Step 1: extract Brie face
Step 3: insert fake Carrey face
Step 2: create fake Carrey face
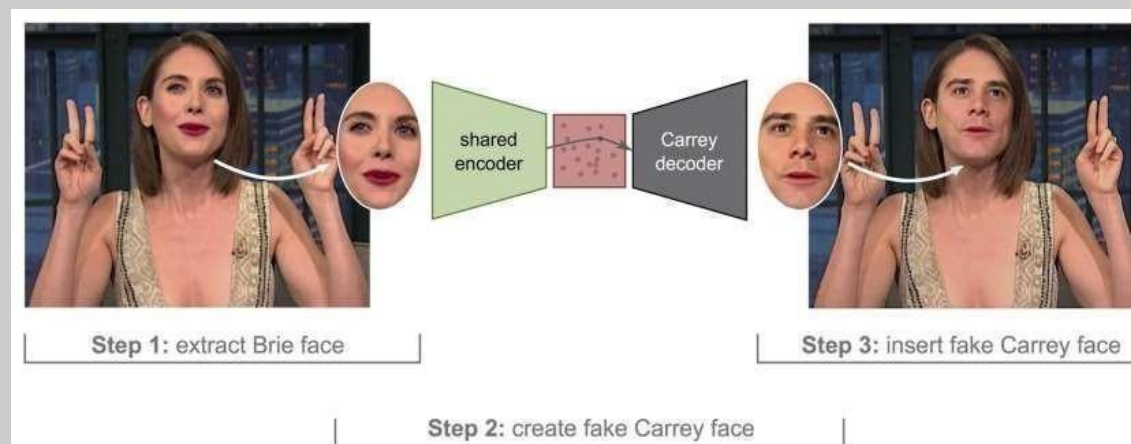
DETECTION CHALLENGE

A climax of these efforts is this year's Deep Face Detection Challenge. Overall, the winning solutions area tour de force of advanced DNNs (an average precision of 82.56 percent by the top performer). These provide us effective tools to expose deep fakes that are automated and mass-produced by AI algorithms. However, we need to be cautious in reading these results Furthermore, these detection results do not reflect the actual detection performance of the algorithm on a single deep fake video, especially ones that have been manually processed and perfected after being generated from the AI algorithms. Such "crafted'' deep fake videos are more likely to cause real damage, and careful manual post processing can reduce or remove artifacts that the detection algorithms are predicated on.

DEEP FAKES AND ELECTIONS

The technology of making deep fakes is at the disposal of ordinary users; there are quite a few software tools freely available on Git Hub, including Fake App, DFaker, face swap- GAN, face swap and Deep Face Lab—so it's not hard to imagine the technology could be used in political campaigns and other significant social events. However, whether we are going to see any form of deep fake videos in the upcoming elections will be largely determined by non-technical considerations. One important factor is cost. Creating deep fakes, albeit much easier than ever before, still requires time, resources and skill.

Compared to other, cheaper approaches to disinformation (e.g., repurposing an existing image or video to a different context), deep fakes are still an expensive and inefficient technology.

FUTURE DETECTION

The competition between the making and detection of deep fakes will not end in the foreseeable future. We will see deep fakes that are easier to make, more realistic and harder to distinguish. The current bottleneck on the lack of details in the synthesis will be overcome by combining with the GAN models. The training and generating time will be reduced with advances in hardware and in lighter-weight neural network structures. In the past few months synthesis we are seeing new algorithms that are able to deliver a much higher level of realism or run in near real time. The latest form of deep fake videos will go beyond simple face swapping, to whole- head synthesis (head puppetry), joint audiovisual synthesis (talking heads) and even whole-body Furthermore, the original deep fakes are only meant to fool human eyes, but recently there are measures to make them also indistinguishable to detection algorithms as well.

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