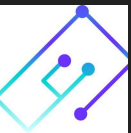# Application Of Deep Learning and Computer Vision In Healthcare

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@elishatofunmi
@rectlabs

Content

- About Myself - A little Intro
- Key Highlights.
- Neural Networks vs Deep Learning.
- Applicable AI in Healthcare.
- Health Organizations & Companies using deep learning.
- Case study: Deep learning and patients records.
  - The Problem?
  - The Solution?
  - The How?
- Conclusion.
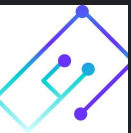
About Myself

- AI Engineer/ Research Scientist (Sports, music & health).
- I am currently building Rectlabs Inc (Research to Products).
- When I am not doing AI I am either on tours, making music, catching fun or sleeping.
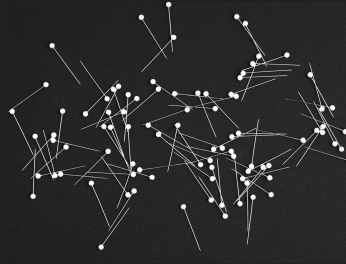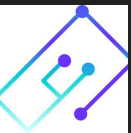- I love to solve problems.
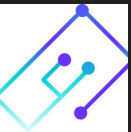
Key Highlights
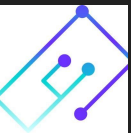
Applications

Deep Learning (computer Vision)

Health Care

Neural Network vs Deep Learning

$$ax^n + bx^{n-1} + cx^{n-2} + dx^{n-3} + \ldots + z = k$$

Discrete Neural Network

$$a_1 x_1^{n-1} + b_1 x_2^{n-2} + c_1 x_3^{n-3} + \ldots + z_1 = k_1$$

$$a_2 x_1^{n-1} + b_2 x_2^{n-2} + c_2 x_3^{n-3} + \ldots + z_2 = k_2$$

$$a_3 x_1^{n-1} + b_3 x_2^{n-2} + c_3 x_3^{n-3} + \ldots + z_3 = k_3$$

$$.$$
$$.$$
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$$a_n x_1^{n-1} + b_n x_2^{n-2} + c_n x_3^{n-3} + \ldots + z_n = k_n$$

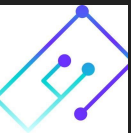**Deep Learning (images) - fundamental vision**

Applicable AI in Healthcare

- Drug Discovery - Elimination of uncertainties.
- Diagnostics (early stage detection of diseases).
  - Diabetic retinopathy - diabetic via deterioration of blood vessels and signs of swollen retina.
  - Retinitis pigmentosa.
  - Cancer - breast, lungs and all.
  - Hypertension.
  - Stages of Arrhythmia via electrocardiogram.
- Genetics - DNA sequencing.
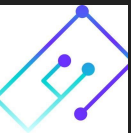
Organizations / Companies

- Instadeep - Medical Imaging.
- Deep minds - protein synthesis
- Retina AI - Eye Care.
- Biosymmetrics - Drug discovery
- Biostrand - Analyzing DNA, RNA and protein data.
- Sensely - Leveraging on the use of chatbots (virtual assistant) to insurance companies, pharmaceuticals, health systems.
- Liverite.
- helpmum.

Deep Learning & Patient records - Synx as case study

4x +5y = 20
3x - 7y = 15

Find x and y

13x +11y = 34
3x - 5y = 23

Find x and y

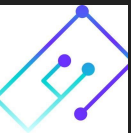x - 4y = 4
4x - 11y = 29

Find x and y

https://synxlabs.netlify.app/
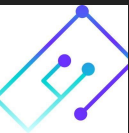
About SynX

- Data Sharing.
- Customer Data Analytics.
- Fraudulent Activity Identification.
- Software Testing & Development.
- Pattern Analysis & Trend Projection.
- Data Monetization.
- Bias Mitigation.
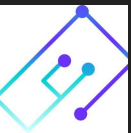- Pattern Analysis & Trend Projection.

The Problem

HealthCare Informations are sensitive information, thereby, difficult to build an efficient health-based AI system without actual datas.
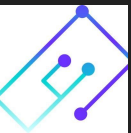
The Solution

- High Synthetic data, better than real-world datas.
- High Differential Privacy (TensorFlow Privacy).
- Data distribution.
- Enhanced model performances.

The How

Language Models & GANs
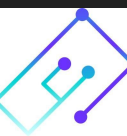
Conclusion

Deep learning has come to stay and she has proven to be relevant in our world today in enhancing a better healthcare system here in Nigeria.