

GM Institute of Technology

Dept. of Artificial Intelligence & Machine Learning

Presentation on

Saturday, 24-Dec-2022 @ 10:30 am

Resource Person

AI/ML on Health Care and
How to Build Career in
Upcoming Tech Stack



Mr. Arun Kumar C

Senior Engineering Leader at Philips.



Dr. Y Vijaya Kumar

Principal, GMIT

Keerthi Prasad G

HoD, Dept. of AIML

Tejasvi Kattimani T R

Head, Dept. of Training &

Placement

Kavyashree B L

Coordinator., Dept. of AIML

Venue : GM Halamma Auditorium



Srishyia Educational Trust (R), Bheemasamudra

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REPORT

DATE : 24/12/2022

TIME : 10.30 am– 12.00.pm

Attendees: Students of I , III and V Semester Students of department AIML.

The technical talk on the *AI in Healthcare & Build career in AI/ML & Blockchain* by Arun C Engineering leader at Philips , Bengaluru, Karnataka, India. More than 120 students of I, III and V semester students are present in that session.

Important Points presented on technical talk for the students on :-

- The data science learning guide and how it is rapidly growing field with plenty of untapped potentials.
- Machine learning techniques like Classification, Clustering, Regression, Anomaly Detection, Attribute Importance, Feature Extraction, Association, Time Series.
- AI Buzz Words some of them are mentioned below

Artificial Intelligence = linear regression & decision trees

Smart Algorithms = random forest

Next-Gen machine learning = boosted trees

AutoML = import autosklearn

Intelligent Automation = Windows scheduler, crontab

MLOps = docker

Customer-centric data lake = we have customer_id in our database tables

Serverless Architecture = I have no idea what a server is

Cloud APIs = my dev-ops guy made me click some link

Advanced Analytics = SQL

DataViz Guru = library(ggplot2)

Data Consultant = often draws convenient conclusions from data

Advanced ML/DL = Python

Image Recognition = MNIST

NLP Experts = transfer learning on GTP-3/Bert

Reproducible experiments = jupyter notebooks



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Maintain source code = git add. && git commit -m "yolo" && git push origin master

Distributed Analytics = no more MySQL on a laptop

Experimentation Framework = z-tests

Advanced Statistics = random control groups

Customer loyalty focus = we spam them with emails

Centre of Excellence = fancy team name to justify pay rises

HR analytics = people leave, we didn't pay them enough

Analytics at scale = no more excel.

- How AI is implemented in the medical devices and their vast application like the device that detect the cancers cells using Radiology, and also
 - Adiology-based Thoracic imaging.
 - Abdominal and pelvic imaging.
 - Colonoscopy.
 - Mammography.
 - Brain imaging.
- shared some important concepts on Web 3.0 & Blockchain, it is used in the healthcare system to preserve and exchange patient data through hospitals, diagnostic laboratories, pharmacy firms, and physicians. Blockchain applications can accurately identify severe mistakes and even dangerous ones in the medical field.



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Photos





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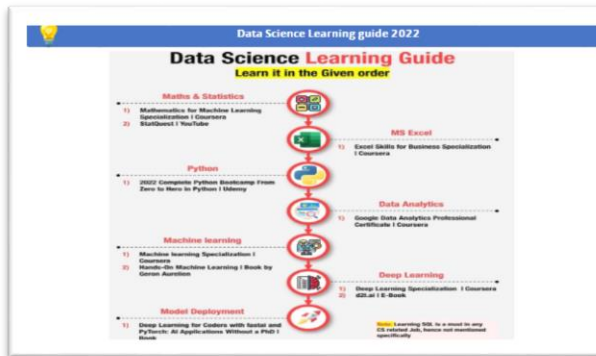
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POINTS DISCUSSED IN TECHNICAL TALK



Data Science Learning guide 2022

- Data science is a solid, rapidly growing field with plenty of untapped potentials.
- The difficulty can be mitigated by creating and implementing a solid educational plan, in other words, a roadmap.
- LinkedIn's Emerging Jobs Report shows that the market is expected to grow significantly over seven years, going from \$37.9 billion in 2019 to \$230.80 billion by 2026.
- This post presents all the information needed to create a data science learning guide for 2022.
- Consequently, aspiring IT professionals interested in a long-lasting career should consider data science their landing spot.
- The easiest way to handle this question is by first defining the term "learning guide."
- learning guide are strategic plans that determine a goal or the desired outcome and feature the significant steps or milestones required to reach it.
- However, learning a new discipline can be challenging.
- Therefore, a data science learning guide is a visual representation of a strategic plan designed to help the aspiring IT professional learn about and succeed in the field of data science



ML Technics

What Machine Learning Technique to Use When?
Machine Learning uses statistical techniques, data, and algorithmic methods to derive inferences very similar to how humans would do. It has multiple types and techniques and so it is very important to understand what kind of Machine Learning algorithm should be used when?

- ✓ Predict likely categories - Classification
- ✓ Discover groups - Clustering
- ✓ Predict numeric values - Regression
- ✓ Identify unusual cases - Anomaly Detection
- ✓ Determine important attributes - Attribute Importance
- ✓ Derive new features - Feature Extraction
- ✓ Identify frequently occurring patterns and rules - Association
- ✓ Identify the most influential row - Row Importance
- ✓ Forecast sequential data - Time Series

ML Technics

AI Buzz Words

- Artificial Intelligence • Intelligence & decision trees
- Smart Algorithms • Random forest
- Next-Gen machine learning • boosted trees
- Autoviz • Import autovis
- Intelligent Automation • Windows scheduler, cronjob
- MLops • DevOps
- Analysis of code • no more excel
- Customer-centric data lake • We track customer's in our database 100%
- Serverless Architecture • There is no need to set up a server
- Cloud APIs • My device can make the decisions for
- Advanced Analytics • SQL
- DevOps Dev • Terraform/Ansible
- Data Consultant • When you're convenient decisions from data
- Advanced ML/OL • Python
- Image Recognition • CVT
- NLP Experts • Handling learning on GPUs/TPU
- Reproducible experiments • Docker/terraform
- Important source code • git add, git commit, git push, git pull
- Deployed Analytics • no more Hadoop, only Databricks
- Backend-oriented Frameworks • APIs
- Advanced Statistics • random control groups
- Customer loyalty focus • We spent them with 40%
- Centre of Excellence • focus team name to justify cost/ROI
- ML products • better able to do what you want enough



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Health Tech Hospital Workflow

- HMS
- EMR
- PACS
- LIS
- RIS
- CT
- PET
- X-Ray
- MRI
- Radiology Viewers
- Radio Therapy
- eICU

Health Tech- Digital Health

US BigTech strategy in Health: despite the recent setbacks of Google & Apple, US Big Tech ambitions persist – with different strategies & assets

Health Tech- Medical Devices

Diagnostic imaging device manufacturers- PACS, Scanners, eICU

- Fujifilm Holdings.
- GE Healthcare.
- Siemens Healthcare.
- Philips Healthcare.
- Shimadzu Corporation.
- Toshiba Medical Systems Corporation.
- Carestream Health.
- Hitachi Medical Corporation.

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AI in Radiology

Background-based thoracic imaging

Lung cancer is one of the most common and deadly tumors. Lung cancer screening can help identify pulmonary nodules, with each detection being a finding in many cases, unless intelligence is brought in automatically to identify these nodules and categorize them as benign or malignant.

Abdominal and pelvic imaging

With the fast growth in medical imaging, especially computed tomography (CT) and magnetic resonance imaging (MRI), new nodules are being found in many cases, unless intelligence is brought in automatically to identify these nodules and categorize them as benign or malignant.

Coronography

Coronary artery disease (CAD) is the leading cause of death in the United States. Although most CAD is not fatal, it can become a major health problem if not treated. CAD is often detected through coronary CT angiography (CTA).

MRI imaging

Brain tumors are characterized by abnormal growth of tissue and can be benign, malignant, primary or metastatic. AI could be used to make diagnostic predictions.

Robotic-assisted

Robotic-assisted planning can be supported by segmenting tumors for radiation dose optimization. Furthermore, dosimetry requires treatment monitoring, and this is a barrier to ensuring the success of radiation therapy. AI is able to perform these assessments, thereby improving accuracy and speed.

AI in Radiology

A colored CT scan showing a tumor in the lung. Artificial intelligence was just as good, and sometimes better, than doctors in diagnosing lung tumors in CT scans. A new study indicates. Credit: Voina/Science Source (PHOTODISC)

A yellow box indicates where an A.I. system found cancer hiding inside breast tissue. Six previous radiologists failed to find the cancer in routine mammograms. Credit: Northwestern University

AI in Radiology

AI for Head CTs: First AI solution to aid detection of 11 findings for timely care.
Traumatic Brain Injuries (TBI) | Fractures & hemorrhages | Stroke pathway infarcts & hemorrhages | Other findings: Atrophies, Mass effect & Midline shift

AI for Chest X-rays: Segregates normal X-rays for reduced TAT.
Pre-read assistance within seconds | Comprehensive findings across lung, heart, pleura, mediastinum, bones, & diaphragm

<https://www.youtube.com/watch?v=imLk45fCniz>



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List of Companies & Tech Tools

<https://health.google/>

<https://developer.android.com/training/wearables/health-services/health-platform>

<https://cloud.google.com/healthcare-api>

<https://www.microsoft.com/en-us/research/project/medical-image-analysis/>

<https://www.microsoft.com/en-us/industry/health/microsoft-cloud-for-healthcare>

TensorFlow

PyTorch

Supporting Healthcare AI Development, Research, and Innovation <https://developer.nvidia.com/industries/healthcare>

Web 3.0 & Blockchain

Blockchain in Healthcare

Transition from Web 2.0 to Web 3.0

Chrome	Brave
Spotify	Audius
Youtube	Odyssey
Facebook	Steemit
Paypal	Metamask
Google	Presearch
Patreon	Fantom
Whatsapp	Status
Go Dreddy	ENS
Dropbox	Filcoin

A Blockchain network is used in the healthcare system to preserve and exchange patient data through hospitals, diagnostic laboratories, pharmacy firms, and physicians. Blockchain applications can accurately identify severe mistakes and even dangerous ones in the medical field

Top 6 Blockchain Platforms

- Ethereum
- Kaleido
- Azure Blockchain Workbench
- IBM Blockchain Platform
- Corda
- Hyperledger

Thank you all

World is changing so fast as new Tech changing everyday.. Detect Early Save billions of life's

India is a country with a billion people and fewer than 10,000 radiologists, a severely imbalanced ratio of 1:100,000 (the corresponding ratio in the US is 1:10,000)

Narayana Health Enhances Quality Patient Care with Microsoft AI and Power BI Solutions

<https://www.youtube.com/watch?v=9y28gWc3kQk>