INTERNSHIP REPORT

An internship report submitted in partial fulfilment of the requirements of IV B.Tech I Semester of

## BACHELOR OF TECHNOLOGY

**in**

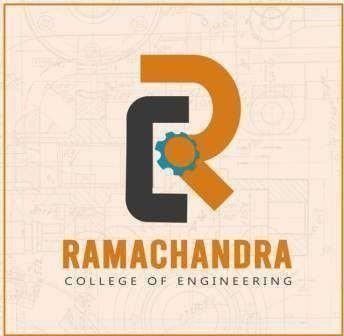
## ARTIFICIAL INTELLIGENCE & DATA SCIENCE

**Submitted By**

**M. Siddartha Teja (20ME1A5430)**

**Under Supervision of**

**Mr. Sd. Arief Assistant Professor, AI&DS**



# RAMACHANDRA COLLEGE OF ENGINEERING(A)

**NH-16 Bypass Road, Vatluru(V), ELURU-534007, A.P. Approved by AICTE, New Delhi, Permanently Affiliated to JNTUK, KKD**

**Recognized by UGC 2(f) & 12(b)**

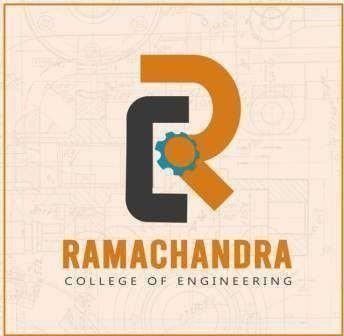
**Accredited by NAAC A+, NBA, ISO 9001: 2015 Certified**

**2023-2024**

# Department of Artificial Intelligence & Data Science



## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE



**CERTIFICATE**

This is to certify that the “**Internship Report**” submitted by **M. Siddartha Teja** Regd. No: **20ME1A5430** is work done by him/her and submitted during 2023-2024 Academic Year in partial fulfilment of the requirements of IV B.Tech I Semester of Bachelor of Technology in Artificial Intelligence and Data Science.

**Mr. Sd. Arief Dr. G. Chamundeswari**

**Assistant Professor, AI&DS Professor**

**Internship Supervisor HOD, AI&DS**

**External Examiner**

**ACKNOWLEDGEMENT**

I would like to take the opportunity to express our deep gratitude to all the people who have extended their cooperation in various ways during my internship. It is my pleasure and responsibility to acknowledge the help of all those individuals.

I would like to thank **Mr. Sd. Arief**, Assistant Professor for giving guidance and support to complete the internship.

I am very grateful to **Dr. G. Chamundeshwari**, Head of the Department, Department of Artificial Intelligence and Data Science for her guidance and encouragement in all respects in carrying throughout my internship.

I would like to express my sincere gratitude to **Dr. M. Srinivas Rao**, Principal, Ramachandra College of Engineering, Eluru for his valuable suggestions during preparation of draft in our document.

I express my heartful gratitude to the Management of Ramachandra College of Engineering, Eluru for their support and encouragement in completing my internship and providing me necessary facilities.

I sincerely thank all the faculty members and staff of the Department of AI&DS for their valuable advices, suggestions and constant encouragement which played a vital role in carrying out my internship.

Finally, I thank one and all who directly or indirectly helped me to complete my internship successfully.

**M. Siddartha Teja**

**20ME1A5430**

# Declaration

We hereby declare that the **internship** on **“AI/ML”** submitted by us to Jawaharlal Nehru Technological University Kakinada in partial fulfilment of the requirements of IV B. Tech I Semester of Bachelor of Technology in Artificial Intelligence & Data Science. This internship work carried out by us under the supervision of **Mr. Sd. Arief,** Assistant Professor in AI&DS.

**M. Siddartha Teja**

**20ME1A5430**

**Abstract**

BM SkillsBuild 6 Weeks Internship in Emerging Technologies in Artificial Intelligence

The IBM SkillsBuild 6 Weeks Internship for Emerging Technologies in Artificial Intelligence

offers a transformative learning experience for individuals aspiring to excel in the field of AI.

Spanning six weeks, the program immerses participants in comprehensive learning tracks that

encompass key facets of AI, including machine learning, natural language processing, and

computer vision. Through hands-on projects and expert mentorship, participants gain practical

insights into real-world AI applications. The internship fosters collaborative learning, enabling

interaction with peers and industry professionals. Upon successful completion, participants

receive a certification that validates their acquired skills and prepares them for the dynamic

landscape of AI. The program is tailored for individuals at all skill levels, making it an inclusive

opportunity for exploration and advancement in the realm of emerging AI technologies

SmartBridge 6 Weeks Internship in Emerging Technologies in Artificial Intelligence powered by Google.

The SmartBridge 6 Weeks Internship for Emerging Technologies in Artificial Intelligence offers a

transformative learning experience for individuals aspiring to excel in the field of AI.

Spanning six weeks, the program immerses participants in comprehensive learning tracks that encompass

key facets of AI, including machine learning, natural language processing, and computer vision.

Through hands-on projects and expert mentorship, participants gain practical insights into real-world AI

applications. The internship fosters collaborative learning, enabling interaction with peers and industry

professionals.

Upon successful completion, participants receive a certification that validates their acquired skills and

prepares them for the dynamic landscape of AI.

The program is tailored for individuals at all skill levels, making it an inclusive opportunity for exploration

and advancement in the realm of emerging AI technologies

The IBM SkillsBuild 6 Weeks Internship for Emerging Technologies in Artificial Intelligence

offers a transformative learning experience for individuals aspiring to excel in the field of AI.

Spanning six weeks, the program immerses participants in comprehensive learning tracks that

encompass key facets of AI, including machine learning, natural language processing, and

computer vision. Through hands-on projects and expert mentorship, participants gain practical

insights into real-world AI applications. The internship fosters collaborative learning, enabling

interaction with peers and industry professionals. Upon successful completion, participants

receive a certification that validates their acquired skills and prepares them for the dynamic

landscape of AI. The program is tailored for individuals at all skill levels, making it an inclusive

opportunity for exploration and advancement in the realm of emerging AI technologies.

**INDEX**

|  |  |  |
| --- | --- | --- |
| **S. No** | **Contents** | **Page No** |
| 1 | Internship Certificate | 7 |
| 2 | Introduction to Company/Institution | 8 |
| 3 | Learning Objectives/Internship Objectives | 9 |
| 4 | Weekly overview of internship activities | 10-11 |
| 5 | Introduction to Internship Topic | 12-13 |
| 6 | Modules | 14 |
| 7 | Description of Internship | 15-16 |
| 8 | Artificial Intelligence | 17-21 |
| 9 | Artificial Intelligence in Practices | 22-25 |
| 10 | AI & ML | 26 |
| 11 | AI & ML Algorithms | 27-28 |
| 12 | Python for AI/ML/DL | 29-32 |
| 13 | Description of Project | 33 |
| 14 | Implementation of Project | 34 |
| 15 | Screenshots | 35-41 |
| 16 | Reflection on the Internship | 42 |
| 17 | Conclusion | 43 |

1. **Internship Certificate:**



1. **Introduction to Company/Institution**

At **SmartBridge**, our cutting-edge edtech platform, "SmartInternz," serves as a catalyst for fostering collaboration between academia and industry. By providing project-based, collaborative learning solutions intricately woven into the curriculum, it empowers students to cultivate the essential technical and professional skills required to become job-ready candidates. The platform's immersive learning journey equips students with the necessary expertise to excel in their chosen careers.

SmartBridge is dedicated to a momentous talent mission: to provide "1 Million Virtual Internships" across a wide range of in-demand technologies. Our goal is twofold: to assist companies in finding job-ready talent and to play a pivotal role in building a thriving gig economy in India.

## Our Objective:

Our main objective is to bridge the existing gaps between prevailing industry standards and what the academics offer to the graduates while passing out of university. SmartBridge offers suitable skill deployment and training to the young talent before on boarding their first job.

Our skill development programs are designed considering the present in demand skills in the industry. We thereby work along the lines to offer best programs that helps the students to gain practical knowledge and hands on training to learn the skills of the future.

### [**Main Objectives Of SmartBridge:**](https://www.thesmartbridge.com/Aboutus)

* Internship for Every Student
* Promote Industry Approved Professional Electives
* Become a Talent Factory of India by 2026

## Our Core Values:

### [Student-Centric Approach](https://www.thesmartbridge.com/Aboutus)

Our students are at the core of everything we do. We prioritize their learning needs, aspirations, and career growth, providing personalized support and guidance.

### [Equal Opportunities](https://www.thesmartbridge.com/Aboutus)

We are committed to ensuring equal opportunities for all students, regardless of their geographical location. We strive to bridge the gap between students studying in cities and remote areas, empowering them with the same level of access to quality education and opportunities.

### [Outcome-Driven Partnerships](https://www.thesmartbridge.com/Aboutus)

We believe in forging partnerships that are focused on tangible outcomes and mutual success. Our collaborations are geared towards achieving concrete results and positive impact.

### [Innovation](https://www.thesmartbridge.com/Aboutus)

Embracing innovation is fundamental to our ethos. We constantly seek new and effective ways to enhance learning experiences, staying at the forefront of emerging technologies and methodologies.

### [Social Impact](https://www.thesmartbridge.com/Aboutus)

We are driven by a sense of responsibility to make a positive impact on society. Our efforts go beyond individual success stories, seeking to uplift communities and contribute to a better world.

1. **Learning Objectives / Internship Objectives**

* Internships are generally thought of to be reserved for college students looking to gain experience in a particular field. However, a wide array of people can benefit from Training Internships in order to receive real world experience and develop their skills.
* An objective for this position should emphasize the skills you already possess in the area and your interest in learning more.
* Internships are utilized in a number of different career fields, including architecture, engineering, healthcare, economics, advertising and many more.
* Some internship is used to allow individuals to perform scientific research while others are specifically designed to allow people to gain first-hand experience working.
* Utilizing internships is a great way to build your resume and develop skills that can be emphasized in your resume for future jobs. When you are applying for a Training Internship, make sure to highlight any special skills or talents that can make you stand apart from the rest of the applicants so that you have an improved chance of landing the position.

1. **WEEKLY OVERVIEW OF INTERNSHIP ACTIVITIES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| I | 05/06/2023 | Monday | Online Session – Explanation of Internship Program |
| 06/06/2023 | Tuesday | Online Session – Account Creation |
| 07/06/2023 | Wednesday | Online Session – Account Creation |
| 08/06/2023 | Thursday | Self-pace Learning – Module1 |
| 09/06/2023 | Friday | Self-pace Learning – Module1 |
| 10/06/2023 | Saturday | Self-pace Learning – Module1 |
| 11/06/2023 | Sunday | Online Session – Q/A Discussion |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| III | 19/06/2023 | Monday | Self-pace Learning – Module4 |
| 20/06/2023 | Tuesday | Self-pace Learning – Module4 |
| 21/06/2023 | Wednesday | Self-pace Learning – Module4 |
| 22/06/2023 | Thursday | Self-pace Learning – Module5 |
| 23/06/2023 | Friday | Self-pace Learning – Module5 |
| 24/06/2023 | Saturday | Self-pace Learning – Module5 |
| 25/06/2023 | Sunday | Online Session – Project Explanation |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| II | 12/06/2023 | Monday | Self-pace Learning – Module2 |
| 13/06/2023 | Tuesday | Self-pace Learning – Module2 |
| 14/06/2023 | Wednesday | Self-pace Learning – Module2 |
| 15/06/2023 | Thursday | Self-pace Learning – Module3 |
| 16/06/2023 | Friday | Self-pace Learning – Module3 |
| 17/06/2023 | Saturday | Self-pace Learning – Module3 |
| 18/06/2023 | Sunday | Online Session – Q/A Session |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| V | 03/07/2023 | Monday | Completion of Hands-on Project + PPT |
| 04/07/2023 | Tuesday | Online Session – Submission Details + Q/A Session |
| 05/07/2023 | Wednesday | Project + PPT Submission |
| 06/07/2023 | Thursday | Project + PPT Submission |
| 07/07/2023 | Friday | Project + PPT Submission |
| 08/07/2023 | Saturday | Project Validation |
| 09/07/2023 | Sunday | Project Validation |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| IV | 26/06/2023 | Monday | Completion of Hands-on Project |
| 27/06/2023 | Tuesday | Completion of Hands-on Project |
| 28/06/2023 | Wednesday | Completion of Hands-on Project |
| 29/06/2023 | Thursday | Completion of Hands-on Project |
| 30/06/2023 | Friday | Online Session – Doubts + Q/A Session |
| 01/07/2023 | Saturday | Completion of Hands-on Project + PPT |
| 02/07/2023 | Sunday | Completion of Hands-on Project + PPT |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Date** | **Day** | **Name of Topic / Module Completed** |
| VI | 10/07/2023 | Monday | Project Validation |
| 11/07/2023 | Tuesday | Project Validation |
| 12/07/2023 | Wednesday | Issuing Certificate of Completion Letter |
| 13/07/2023 | Thursday | Issuing Certificate of Completion Letter |
| 14/07/2023 | Friday | Issuing Certificate of Internship |
| 15/07/2023 | Saturday | Issuing Certificate of Internship |
| 16/07/2023 | Sunday | Issuing Certificate of Internship |

1. **Introduction to Internship Topic**

**Topic: Artificial Intelligence - Machine Learning**

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

**How does AI work?**

As the hype around AI has accelerated, vendors have been scrambling to promote how their products and services use it. Often, what they refer to as AI is simply a component of the technology, such as machine learning. AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No single programming language is synonymous with AI, but Python, R, Java, C++ and Julia have features popular with AI developers**.**

**Advantages of AI**

The following are some advantages of AI.

* Good at detail-oriented jobs. AI has proven to be just as good, if not better than doctors at diagnosing certain cancers, including breast cancer and melanoma.
* Reduced time for data-heavy tasks. AI is widely used in data-heavy industries, including banking and securities, pharma and insurance, to reduce the time it takes to analyze big data sets. Financial services, for example, routinely use AI to process loan applications and detect fraud.
* Saves labor and increases productivity. An example here is the use of warehouse automation, which grew during the pandemic and is expected to increase with the integration of AI and machine learning.
* Delivers consistent results. The best AI translation tools deliver high levels of consistency, offering even small businesses the ability to reach customers in their native language.
* Can improve customer satisfaction through personalization. AI can personalize content, messaging, ads, recommendations and websites to individual customers.
* AI-powered virtual agents are always available. AI programs do not need to sleep or take breaks, providing 24/7 service.

**Disadvantages of AI**

The following are some disadvantages of AI.

* Expensive.
* Requires deep technical expertise.
* Limited supply of qualified workers to build AI tools.
* Reflects the biases of its training data, at scale.
* Lack of ability to generalize from one task to another.
* Eliminates human jobs, increasing unemployment rates.

**What are the applications of AI?**

Artificial intelligence has made its way into a wide variety of markets. Here are 11 examples.

* AI in healthcare
* AI in business
* AI in education
* AI in finance
* AI in law
* AI in entertainment and media.
* AI in software coding and IT processes
* Security
* AI in manufacturing
* AI in banking
* AI in transportation

1. **Modules**
2. Artificial Intelligence
3. Artificial Intelligence in Practices
4. AI & ML
5. AI & ML Algorithms
6. Python for AI/ML/DL
7. **Description of Internship:**

SmartBridge and Google have teamed up to create an outcome-driven skilling effort that will train 2000+

educators and 5000 students on android application development in Kotlin programming. This program has

been recognised by AICTE for delivery as a virtual internship program to all higher education students in

India.

Program will be executed in two phases, phase-1 is to teach the educators on android skills and application

lifecycle management and qualify them as "Mentor on Campus" to drive the phase-2 of the program in

campus called virtual internship program. The virtual internship program is 100+ Hrs. experiential learning

program containing hands-on bootcamps, courses, learning resources and project work.

Successful learners will be receiving the virtual internship completion certificate. Also, they will get an

opportunity to join the Google developer community in India.

**Process**

The internship is delivered virtually to all students, over a 6week duration from the start date

The internship is delivered in groups of students under a pre-selected problem statement. Each of the 15 problem statements will be assigned a mentor along with 40-60 students

The mentor will introduce the problem statement, help brainstorm solutions and guide students towards the technologies and skills required to solve the problem statement

The internship concludes with the submission of the project and the delivery of a presentation

Top teams are awarded for their ingenuity, along with the internship completion certificate and the remaining teams are provided Internship certificates

##### **Duration**

Program Launch: 6 June 2022

Registration Ends on: 30 July 2022

Virtual Internship Starts on: 1 August 2022

Virtual Internship Ends on: 30 September 2022

Certificate Distribution by: 15 October 2022

**Mentoring sessions**

* Should be 2-3 hours per week
* Preferable time slots
  + Weekdays – After 5 PM
  + Weekends – First Half

**Structured Self-Learning**

* Completion of mentor-recommended SkillsBuild Courses
* Progress on Project

Upon conclusion of the Virtual Internship students are expected to have completed three tasks:

* Completion of selected self-paced learning courses on IBM SkillsBuild
* Submission of Project files
* Submission of a final project presentation

1. **Artificial Intelligence**

**What is Artificial Intelligence?**

**Introduction:**

Artificial intelligence, or **AI**, is the science of making machines smart. Thanks to recent

breakthroughs in computer science, machines are learning how to solve problems, something we used to think

only humans could do.

Before we begin, try answering this mind-bending question. Give it some thought! You’ll uncover the right

answer as you continue through the course.

**Do you think that machines, like humans and dogs, can learn when they get a reward for doing**

**something right?**

1. Yes
2. B. No, that’s silly

**Can a computer really think?**

#### 

#### **The thinking machine is not a new idea**

For centuries, people have imagined machines that think and behave like

people. The Greek god Hephaestus was said to have built golden machines to work for him. In the 1920s,

Czech writer Karel Capek imagined metal people who thought like humans, and he coined the word “robot”

to describe them. In 1950, English mathematician Alan Turing wondered whether a machine could ever think,

and famously asked “How can we tell if a machine is thinking?” To answer the question, he reasoned that

“thinking” is hard to define, so it might be better to look instead at thinking as a behaviour. He proposed a test:

if a machine can carry on a conversation with a human, and the human can’t tell that it’s a machine, then we

can safely say that the machine is “thinking.”

Soon afterward, in 1956, the modern field of artificial intelligence took off at Dartmouth College when a

group of scientists predicted that a machine as intelligent as a human could be built within the next

generation. They were off by a few decades, but their vision has guided the modern field of AI, and Turing’s

test remains the gold standard for identifying machine thinking.

##### **We can test machine thinking with an “imitation game”**

In Turing’s test, an interrogator communicates through a keyboard with either a machine or a

person, but does not know which is on the other end of the line.

**Computers help humans !!**

#### **Human Intelligence versus Artificial Intelligence**

To have a conversation about artificial intelligence (AI), we need a practical definition

of human intelligence (HI). Let’s consider that human intelligence is the ability to reason, solve problems,

and learn. These activities involve a complex interaction between cognitive functions like perception,

memory, language, and planning.

People do these things naturally because human intelligence enables us to learn from past experience, adapt to

new situations, and handle abstract ideas. Humans can use learned knowledge to adapt to, shape, and change

their environment.

**Types of AI:**

AI can process data and make certain kinds of predictions faster and more accurately than

humans. But it isn’t magic and it isn’t all-powerful.

Let’s look at different levels of AI and what they can accomplish.

1. **Weak AI:**

Many companies use weak AI to automate tasks to get results quickly and at lower costs. Weak AI

outperforms humans in narrowly defined tasks. Think of a chatbot that answers customer service questions,

facial recognition on Facebook, buying recommendations on Amazon, or apps that can convert voice to text.

Alexa, Google Assistant, and Siri all demonstrate weak AI.

1. **Augmented Intelligence:**

Augmented intelligence supplements human intelligence, helping humans make better

decisions. It doesn’t replace humans. Instead, it boosts their expertise and improves their productivity.

IBM Watson for Oncology, for example, helps health professionals identify key information in a

cancer patient’s medical records, and it recommends several possible treatments along with estimates

of how each one might work. Its recommendations are excellent, based on constantly updated research

in cancer science. But it doesn’t choose the patient’s treatment. That’s up to the health professional. In

other words, augmented intelligence helps humans become faster and smarter at the tasks they’re

performing.

1. **General AI:**

General AI doesn’t exist yet. But when it does, it will be a form of “whole brain

emulation,” where a machine can think and make decisions on many different subjects. It will drive

the computers you see on science-fiction video, talking to humans about many subjects, while

operating entire cities or starships. Today, general AI is a goal rather than a practical technology. It

will require decades of additional research and more powerful computers to achieve.

**Maybe you’ve heard about machine learning and deep learning, too?**

Next, let’s explore important terms that describe ways that AI can solve complex problems.

The following graphic provides a good summary of the relationship between AI, machine learning,

and deep learning.

**Artificial Intelligence:**

Artificial intelligence describes machines that exercise capabilities usually

associated with human intelligence. Current research in AI focuses on learning, reasoning, problem

solving, perceiving, and understanding human language. You’ll learn more in the next course about

how advances in AI will help make us all smarter, communicate, solve problems for society, and

change the way we work**.**

**Machine Learning:**

Machine learning, or ML, uses algorithms to learn from data. Given an input of

data, ML can perform statistical analysis to determine an output. As with every kind of computing, the

more data the machine is given (assuming that this data is valid), the more accurate is its output. ML

uses human-like capabilities such as analysis, self-training, observation, and experience to learn

without being explicitly programmed!

ML comes in three flavours: supervised learning, unsupervised learning, and reinforcement learning.

ML relies on these three types of algorithms. The application of any one of these algorithms depends

on the relation to available data you are processing, the output that you need from your model, or

maybe even the possibility of retro-feeding data to improve the algorithm. If it sounds complicated, it

is.

One amazing aspect of machine learning is its ability to modify itself when exposed to more data. It’s

dynamic and doesn’t require human intervention to make changes! So as it’s exposed to more data, it

continues to learn and improve its results.

Machine learning is what prompted the bank to contact you about what might be someone using

stolen information from your credit card. But it’s not perfect. Machine learning is also what threw off

your Netflix recommendations after someone in your family watched a weird comedy on your

account.

**Deep Learning:**

Deep learning, or DL, is a subcategory of machine learning that focuses on statistical

models when it solves problems. It uses an artificial neural network, made of algorithms inspired by

the human brain, as it solves complex problems by performing tasks over and over again many

thousand times, each time tweaking it a little to improve the outcome. DL requires big data and

enormous computing power, but has tremendous potential as we move toward the goal of general AI.

Imagine the complexity of decisions to perform classification tasks directly from images, text, or

sound with accuracy that might exceed human performance. How about driverless cars?

Deep learning is a key technology behind driverless cars, enabling the computer to recognize a stop

sign or to distinguish a pedestrian from a street light.

**Other Technologies help AI:**

AI will create new opportunities for society, business, and for

consumers. But for AI to be more widely adopted, other enabling technologies need to mature

alongside it.

Cloud, for example, is already helping businesses access and share computing power they

wouldn’t normally be able to afford. This shared technology, in turn, will enable those

businesses to operate new training algorithms and data management required by AI.

Other emerging technologies will also be vital to AI’s growth. Visual recognition, natural

language processing, predictive analytics, and even the Internet of Things (IoT) will empower

AI, leading to new applications in medical devices, security, customer service, and more!

1. **Artificial Intelligence in Practices**

**Introduction:**

**AI is already part of your life**

In 2011, people around the world who had never given artificial intelligence (AI) much thought suddenly encountered it—on Jeopardy!, a television quiz show. Take a moment to guess the answer to a question about that historic moment:

When scientists trained the IBM Watson AI program to compete with tournament champions on Jeopardy!, what do you think was their primary source of information for the program to use when answering the quiz show’s questions?

A. Wikipedia

B. The Library of Congress

C. A group of scholars from MIT

Keep your best guess in mind as you continue. You’ll find the answer later in this course.

Now, let’s get personal. As we dig into ways that AI has touched our everyday life, consider how it has affected your own life.

**AI Can Communicate:**

*AI understands human language*

In any language, there can be hundreds of ways to express a simple idea. Our brains have known since childhood how to process sentences and make sense of them. But computers can’t do that using traditional programming methods. It’s impossible for a programmer to cook up the exact wording for every possible sentence someone might say to a computer! Instead, AI scientists have helped computers understand language using a branch of computer science called natural language processing, or NLP.

NLP powers chatbots, the computerized systems that provide basic customer service. You type or speak a question using a simple, ordinary sentence. The chatbot usually understands your question and responds accordingly.

You’ll find an advanced application of NLP in the virtual assistants provided by smart phones and personal computing devices. Amazon’s Alexa, Microsoft’s Cortana, and Apple’s Siri can understand more complex questions.

**AI can help you to do things:**

*AI can perform difficult tasks on your behalf*

AI can perform complex work once thought to be possible only for humans. Consider self-driving cars. Using cameras, radar, lidar, and GPS, they receive all sorts of inputs—road surface, speed limit, lane lines, traffic, pedestrians, light conditions, road signs, and more, all changing at highway speed! Their AI swiftly integrates these inputs and makes decisions to safely and accurately navigate the road.

**AI can help you discover things:**

AI can also automate searches, marketing, and advertising. By automatically analyzing data about your behavior and preferences, AI can make predictions or recommendations that are specific to you, or that reflect people similar to you.

Amazon, for example, remembers books you’ve bought and suggests others that might also please you. LinkedIn recommends jobs that suit your profile. Netflix recommends programs similar to those you have already enjoyed. Right now, these recommendations have mixed value. If you buy socks on Amazon, it will recommend more socks to you whether you need them or not. But this kind of AI is advancing rapidly in its ability to personalize what it offers you.

**AI Can Solve Problems:**

*AI can help humanity*

In the flood-prone region of Patna in northern India, the waters were rising. But thanks in part

to an artificial intelligence system, residents of the region received early warnings on their

phones. A flood forecasting system that Google developed for India’s Central Water

Commission is making a difference! But it can do more than forecast high waters. It’s also

smart enough to avoid false alarms.

Sella Nevo, the head of the flood forecasting unit and a software engineering manager at

Google, notes that “For our high-risk alerts, we had less than 10 percent false positives [down

to regions measuring 64 by 64 meters] ... That’s highly accurate.” The trick is training the

system’s accuracy so that unnecessary evacuations are avoided and trust can be built for the

alert system.

***But good solutions require good data:***

If you or your friends enjoy computer programming, you’ve probably heard the acronym

GIGO. It means “garbage in, garbage out.” When you work with bad data you’ll get bad

results.

GIGO also applies to AI. The most brilliant system can’t solve problems without high-quality

data. It’s not enough to design the system well. You must also give it the ability to spot false

information and to clean information that contains errors.

Keep that in mind as you consider this question:

If you’re designing AI to provide reliable hurricane warnings, what kinds of data would it require and what data might cause problems?

**AI Can Play Games:**

*Gaming applications for AI*

Some of the most famous applications of artificial intelligence have emerged from the world

of games. Let’s find out how.

It begins with programs designed to win difficult games. For years, the world’s greatest chess

masters have tested their skills against computer opponents: from IBM’s Deep Blue to the

current champion computer, Stockfish 9. This kind of advanced but narrow AI can’t pilot a

self-driving car, carry on a conversation, or provide accurate flood warnings, but it’s

undefeated against the world’s greatest human chess players.

You’ve already read how natural language processing helped IBM Watson win the Jeopardy!

championship (along with a huge set of data culled from Wikipedia and other sources).

**AI Can extend Human Expertise:**

*Intelligence augmentation*

There’s another way to look at artificial intelligence: instead of making

decisions for us, we can design it to help us make better decisions. We call this intelligence

augmentation. It refers to the development of computerized tools that complement human thinking.

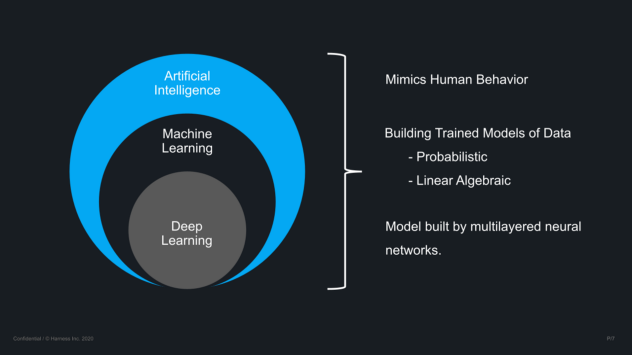
1. **AI & ML**

**Introduction:**

Many companies will market their systems or services as “powered by AI” when it’s not often

the case. We will always find these instances of gimmicky marketing, so it is helpful to first understand what

is AI and ML, and the different terms, as there are many relevant use cases of AI and ML in our world today.

****

Artificial Intelligence is a technique for building systems that mimic human behavior or decision-making.

Machine Learning is a subset of AI that uses data to solve tasks. These solvers are trained models of data that

learn based on the information provided to them. This information is derived from probability theory and

linear algebra. ML algorithms use our data to learn and automatically solve predictive tasks.

Deep Learning is a subset of machine learning which relies on multilayered neural networks to solve these tasks.

1. **AI & ML Algorithms**

There are three kinds of machine learning: supervised, unsupervised, and reinforcement learning. Each form solves problems differently.

**Supervised Machine Learning:**

In supervised machine learning, we know about the data and the problem. Think of it as, “given a set of features x, we know the value of y,” and so in supervised learning, we create a function that approximates results based on some set of data.

There are two kinds of supervised learning: classification and regression. In a classification problem, we assign data to categories. For example, given a client’s medical information, they test positive or negative for diabetes. In classifications, our trained models, known as classifiers, classify data points into different groups.

If we instead wanted to solve a different problem, like predicting the future value of GameStop stock given the stock market history, we’d turn to a regression. In regression, we return numerical values. Given some sentences, this is the percent likelihood the person is happy or sad.

**Unsupervised Machine Learning:**

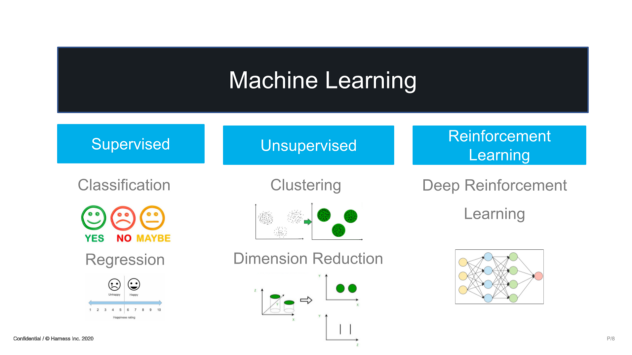
In unsupervised machine learning, our data is unlabeled. There are two forms of unsupervised machine learning: clustering and dimension reduction.

In clustering, we learn more about data points as they are clustered, or grouped together. This allows learned models to understand a data set, detect anomalies, and assign relationships between points, often allowing users to develop new categories or features about the data set.

In dimension reduction, we plot data points across different dimensions and feature sets to understand our data sets. This allows for techniques like feature selection or transformation. Dimension reduction solves the curse of dimensionality. The more features to a data set, the more data is needed, and processing many noisy features can impact the performance of an ML model, so unsupervised machine learning techniques are often paired with supervised or reinforcement learning algorithms.

**Reinforcement Learning:**

In reinforcement learning (RL), we are learning models over time. A common technique is to utilize deep learning with reinforcement learning to derive relationships between features of a data set that may not otherwise be solved through human research. Deep learning RL has been very successful in the field of medicine as of late.



1. **Python for AI/ML/DL**

The field of artificial intelligence (AI) and machine learning (ML) is rapidly growing, with the potential to revolutionize the way we live and work. At the heart of AI and ML development is the Python programming language, which has become the go-to language for data science, analytics, and modeling. In this blog post, we will explore the role of Python in AI and machine learning development, highlighting its key advantages, popular libraries, and real-world applications.

First, we’ll define what we mean by AI and ML, and why they matter. AI refers to the development of intelligent machines that can perform tasks that typically require human intelligence, such as visual perception, speech recognition, and decision-making. ML, on the other hand, is a subset of AI that involves the use of algorithms and statistical models to enable machines to learn from data without being explicitly programmed. Both AI and ML have the potential to drive innovation and improve efficiency across a wide range of industries.

Python has emerged as the language of choice for AI and ML development due to its simplicity, flexibility, and rich ecosystem of libraries and tools. It allows developers to easily build, test, and deploy complex models, and has become a standard language in the field of data science.

In the following sections, we’ll explore Python’s role in AI and machine learning in more detail. We’ll look at the advantages of using Python for AI and ML development, including its ease of use, versatility, and compatibility with popular libraries such as TensorFlow, Keras, Scikit-learn, and PyTorch. We’ll also examine some real-world applications of Python in AI and ML, including computer vision, natural language processing, and predictive analytics.

**Python’s Role in AI**

Python has become a key player in AI development due to its many advantages over other programming languages. Let’s explore some of the key benefits of using Python for AI:

**Easy to use**

Python’s simple syntax and dynamic typing make it an ideal language for beginners and experts alike. It’s easy to read and write, which reduces the learning curve and makes it easier to build complex AI systems.

**Versatility**

Python can be used for a wide range of tasks, from data preprocessing and cleaning to model training and deployment. It’s a general-purpose language that can be used in many different domains, including web development, automation, and scientific computing.

**Compatibility with popular libraries**

Python has a rich ecosystem of libraries and tools that make it easy to build and deploy AI models. TensorFlow, Keras, Scikit-learn, and PyTorch are just a few examples of the many libraries available for Python that make AI development more efficient and effective.

Python’s role in AI is also important for businesses that rely on AI systems to improve their operations. Staffing agencies, for example, use AI to automate many aspects of their operations, from resume screening to candidate matching. Python’s ease of use and versatility make it a key language for building these systems, and its compatibility with popular libraries like TensorFlow and Keras makes it easier to develop advanced models that can handle large datasets and complex tasks.

In summary, Python’s role in AI is crucial, and its many advantages make it the go-to language for developers and businesses that are looking to build intelligent systems. In the next section, we’ll explore Python’s role in machine learning in more detail.

**Python’s Role in Machine Learning**

Python has also become a popular language for machine learning development due to its many advantages. Let’s explore some of the key benefits of using Python for machine learning:

**Easy to learn**

Python’s simple syntax and readability make it an ideal language for beginners to learn. This makes it easier for new developers to enter the field of machine learning.

**Flexible and versatile**

Python is a general-purpose language that can be used for a wide range of tasks, including data processing, visualization, and modeling. This versatility makes it an ideal language for machine learning, where different tasks require different types of code.

**Powerful libraries and frameworks**

Python has a rich ecosystem of libraries and frameworks that make it easy to perform complex machine learning tasks. Popular libraries and frameworks include TensorFlow, Keras, PyTorch, and Scikit-learn.

Python’s role in machine learning is also important for businesses, such as IT staffing agencies, that rely on machine learning to improve their operations. For example, an IT staffing agency might use machine learning to screen resumes, match candidates with job openings, and predict which candidates are most likely to succeed in a particular role. Python’s flexibility and powerful libraries make it easier to build and deploy these systems, which can lead to more efficient and effective staffing processes.

In summary, Python’s role in machine learning is critical, and its many advantages make it a top choice for developers and businesses that are looking to build intelligent systems. In the next section, we’ll explore some popular Python libraries for AI and machine learning development.

**Popular Python Libraries for AI and Machine Learning**

Python’s popularity in AI and machine learning is largely due to its many powerful libraries and frameworks. Here are some of the most popular libraries for AI and machine learning development in Python:

**TensorFlow**

Developed by Google, TensorFlow is an open-source library for building and deploying machine learning models. It’s designed to handle large-scale data and complex models, and it supports both deep learning and traditional machine learning techniques.

**Keras**

Keras is a high-level API for building and training deep learning models. It’s designed to be user-friendly and flexible, and it can run on top of TensorFlow, Theano, or Microsoft Cognitive Toolkit.

**PyTorch**

Developed by Facebook, PyTorch is an open-source library for building and deploying deep learning models. It’s designed to be flexible and easy to use, and it supports dynamic computational graphs, which make it easier to debug and optimize models.

**Scikit-learn**

Scikit-learn is a library for machine learning in Python that provides simple and efficient tools for data mining and data analysis. It includes a range of supervised and unsupervised learning algorithms, as well as tools for model selection and evaluation.

These libraries and frameworks are useful for businesses, such as staffing agencies, that rely on AI and machine learning to improve their operations. For example, an IT staffing agency might use Scikit-learn to classify candidates based on their skills and experience, or use Keras to build a neural network that predicts which candidates are most likely to be a good fit for a particular role.

In summary, Python’s rich ecosystem of libraries and frameworks makes it an ideal language for building intelligent systems. In the next section, we’ll explore some real-world applications of Python in AI and machine learning.

1. **Project Description**

Employee burnout analysis in AI projects refers to the process of using artificial intelligence techniques to identify and assess burnout levels among employees working on AI projects. Burnout is a state of chronic physical and emotional exhaustion, often accompanied by feelings of cynicism and detachment from work. It can result from prolonged periods of stress, high workloads, and a lack of work-life balance.

**Reasons:**

**Early detection:** AI algorithms can be trained to detect patterns and indicators of burnout based on various data sources, such as employee surveys, performance metrics, communication logs, and physiological data.

**Risk mitigation:** By identifying burnout risks, AI can assist in implementing preventive measures to mitigate those risks.

**Performance optimization:** Burnout can negatively impact productivity, quality of work, and employee satisfaction. AI analysis can provide insights into the correlation between burnout and performance metrics.

**Personalized interventions:** AI can provide personalized recommendations or interventions to address burnout. These interventions may include suggestions for work-life balance, stress reduction techniques, or guidance on seeking support from relevant resources within the organization.

However, it's crucial to consider ethical considerations and privacy concerns when implementing AI-based burnout analysis. Confidentiality, data protection, and transparency should be prioritized to ensure employee trust and well-being.

1. **Implementation of Project**

**Dataset:** The dataset has provided by Edunet Foundation and IBM Skillsbuild via an xlsx sheet and it

contains the following features or columns in it:

* **Employee ID:** The unique ID allocated for each employee (example: fffe390032003000)
* **Date of Joining:** The date-time when the employee has joined the organization (example: 2008-12-

30)

* **Gender:** The gender of the employee (Male/Female)
* **Company Type:** The type of company where the employee is working (Service/Product)
* **WFH Setup Available**: Is the work from home facility available for the employee (Yes/No)
* **Designation:** The designation of the employee of work in the organization. In the range of [0.0, 5.0]

bigger is higher designation.

* **Resource Allocation:** The amount of resource allocated to the employee to work, ie. number of

working hours. In the range of [1.0, 10.0] (higher means more resource)

* **Mental Fatigue Score:** The level of fatigue mentally the employee is facing. In the range of [0.0,

10.0] where 0.0 means no fatigue and 10.0 means completely fatigue.

* **Burn Rate:** The value we need to predict for each employee telling the rate of Bur out while working.

In the range of [0.0, 1.0] where the higher the value is more is the burn out.

**Libraries Used:**

**NumPy:** NumPy can be used to perform a wide variety of mathematical operations on arrays. It adds

powerful data structures to Python that guarantee efficient calculations with arrays and matrices and it

supplies an enormous library of high-level mathematical functions that operate on these arrays and matrices.

**Pandas:** Pandas is a Python library used for working with data sets. It has functions for analyzing, cleaning,

exploring, and manipulating data.

**Sklearn:** Scikit-Learnis an open-source machine learning library that supports supervised and

unsupervised learning. It also provides various tools for model fitting, data preprocessing, model selection,

model evaluation, and many other utilities.

1. **Screenshots:**
2. **Reflection on Internship**

My internship in AI powered by Google has been a journey of discovery and growth. From the outset, I was immersed in diverse datasets, challenging me to apply theoretical knowledge to real-world scenarios. The hands-on experience with tools has been instrumental in expanding my technical proficiency. Through collaborative projects, I've learned to navigate the complexities of team dynamics and appreciate the synergy required for effective data-driven decision-making. One key takeaway has been the significance of adaptability in the face of evolving data landscapes. The rapid pace of technological advancements became evident, prompting me to stay abreast of industry trends and continuously upskill. Additionally, I've developed a keen awareness of the ethical considerations surrounding data analytics, emphasizing the importance of responsible and transparent practices.

Moreover, this internship has underscored the vital role of effective communication in the analytics process. Presenting findings to both technical and non-technical stakeholders challenged me to convey complex insights in a clear and compelling manner, bridging the gap between data and actionable strategies.

In retrospect, this internship has not only refined my technical skills but has also cultivated a holistic understanding of the multifaceted nature of data analytics. As I move forward in my career, I carry with me a sense of accomplishment, equipped with the practical insights and lessons gained during this enriching experience.

## CONCLUSION

In conclusion, my internship in AI powered by Google has been a transformative experience, providing me with hands-on exposure to real-world data challenges. I've honed my analytical and technical skills, gained proficiency in tools like Sklearn, Linear Regression, Logistic Regression, and collaborated effectively with cross- functional teams. This internship has not only deepened my understanding of data analysis but also equipped me with practical insights that will undoubtedly contribute to my future endeavors in the field. I am grateful for the opportunities for growth and learning, and I look forward to applying these skills in future roles. Furthermore, this internship has reinforced the importance of clear communication in translating complex findings into actionable insights. I've had the opportunity to present my analyses to stakeholders, refining my ability to convey technical information in a digestible manner. The constructive feedback received has been invaluable, shaping my communication skills and enhancing my overall professional development. As I reflect on this experience, I am confident that the lessons learned and the relationships built will be integral to my continued growth in the dynamic and evolving field of data analytics.