

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

CAREER GUIDE

INTRODUCTION

Data has garnered a great deal of attention over the past decade and is being considered as the new oil because it's extremely valuable to organisational success. This data economy with its vast reservoir of vital information is pushing for innovations in data science, Artificial Intelligence, Machine Learning, and Deep Learning technologies. Machines are learning from data to derive patterns and insights to aid various applications and processes.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE

With the fast-paced advancements in the field of Artificial Intelligence and related technologies, one can witness AI applications being used in their routine lives. Automated customer support systems, chatbots, and personalized shopping experience with product recommendations are a common example of this.

With smart autonomous cars driving on roads and autonomous drones delivering items directly to doorsteps, a great deal of transportation and service issues will be resolved effectively. Companies like Walmart and Amazon are investing heavily in making the drone delivery a reality and an efficient system of delivering goods faster and safely.

The creative fields are also adopting AI as a means of exploring new ideas in art and music in this technologically advanced era. Other applications of AI can be witnessed in the new-age Security and Surveillance systems where technologies like image processing, data science, facial recognition, and voice recognition are helping security forces to develop better systems to identify and act upon security breaches, many a time before they actually happen.

IMPORTANCE OF AI

Artificial Intelligence is influencing people and businesses at a massive scale and has become an inseparable component. The scope of AI will only increase in the near future. The everyday interaction with AI to make our lives simpler is evident in the way we use our smartphones to navigate around the city with live insights on traffic, suitable and fastest routes, and other recommendations. Also, the virtual digital assistants such as Cortana or Alexa are making our lives simpler than ever.

Businesses are exploring the scope and utility of AI to devise new products, processes, and capabilities with an aim to gain competitive advantage along with saving cost and time. The vast amount of data collected by businesses along with concepts like the Internet of Things are driving marketing decisions and improving operations and customer service.

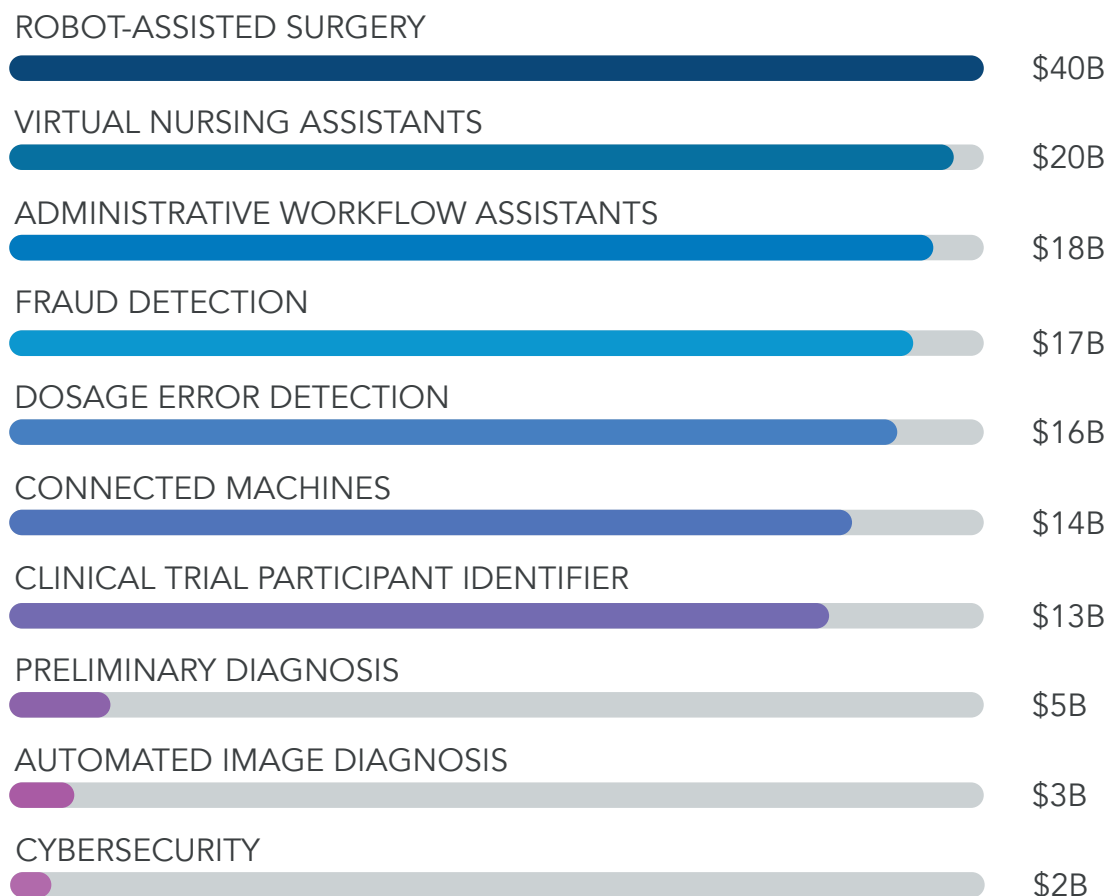


INDUSTRY APPLICATIONS OF AI

Healthcare and Entertainment are two sectors that are being massively influenced by Artificial Intelligence.

Healthcare

AI technologies are being developed to help medical institutions to streamline clinical as well as administrative healthcare processes. Accenture analyzed the AI applications in healthcare in terms of estimated potential annual benefits by application by 2026. Here is what the study established:



Source: Forbes Insights - AI And Healthcare: A Giant Opportunity

Entertainment

Today media and entertainment companies are training ML algorithms to design advertisements and develop film trailers. Personalized user experience is given a lot of importance with streaming channels that recommend content based on specific user activity and behaviour.

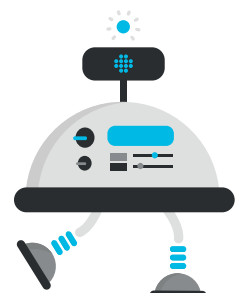
Artificial Intelligence softwares are improving the speed and efficiency of the media production process and the ability to organize visual assets. Many gaming platforms are also adopting new technologies to bring more interactive gaming experience. Sports show maximum affinity towards using Artificial Intelligence for game preparation and real-time analysis of the on-field action.



Banking and Finance

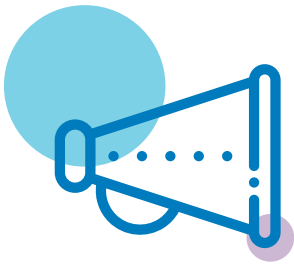
Applications of Artificial Intelligence in Banking and Finance are set to revolutionize the industry and bring it up to a more secure and sophisticated platform. AI is being used to detect anti-money laundering patterns, which is much more efficient than the traditional rule-based software systems.

Talking about Algorithmic trading, reports suggest that automated AI systems are behind more than 70% of the trading today. One of the fields where AI has proved to provide the most accurate and superior results is 'Fraud Detection'. Apart from the regulatory and legal aspects, banks and financial institutions are using chatbots and virtual assistants to provide better customer service than ever.



Marketing

AI-generated content is big news among the content-generating and aggregating agencies and professionals. Smart content curation allows better engagement with visitors on a website by showing content pieces relevant to them. Another aspect is Voice Search which is set to change the future SEO strategies. Brands need to keep up and leverage huge returns on organic traffic with high purchase intent.



Marketing automation, programmatic media buying, propensity modelling, predictive analytics, and lead scoring are other applications where AI can leverage better results. Some Machine Learning algorithms can run through a vast amount of historical data to draw insights on the ads which performed best, audience targeted for the same, and buying stage.

AI is also helping in evolving the concept of dynamic pricing, web and app personalization, chatbots, and re-targeting, some of the marketing aspects directed towards conversion.

Retail and e-commerce

Image search is a very important application of Artificial Intelligence for e-commerce. It makes it so much easier for shoppers to search products similar to a product image across sellers online. AI is also deriving sense and insights out of the massive amount of data generated by the minute.

Product recommendations, Chatbots, and efficient after-sales services backed by AI are directed towards high customer satisfaction, engagement, and finally, loyalty. AI is also helping retail brands manage their inventories, improve their CRM, and develop a better sales process.

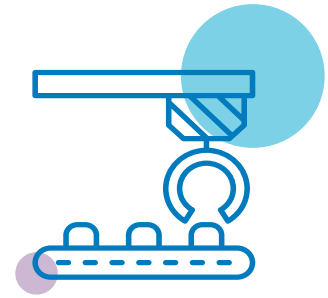


Manufacturing

Smart factories are primarily driven by AI concepts and technologies taking active measures for increased productivity, environment friendliness, and quality of life at these intensive workplaces. Artificial Intelligence is being applied for quality checks, maintenance, and creating more reliable designs and layouts for the plant and its processes.

Apart from that, it is also reducing environmental impact by applying methods of cutting down waste and using the resources optimally. An example of this is demonstrated by Siemens, where hundreds of sensors feed an AI operating data processing system to adjust fuel valves to keep emissions as low as possible.

Applications of AI are myriad in manufacturing and not just limited to the ones mentioned here. One can witness how AI works wonders with different aspects of the supply chain.



The outcome of these applications and the general acceptability of these technologies can be seen in the form of increased job opportunities and new work domains. This has created a necessity to learn new skills and move from the older redundant roles to the new high paying jobs, given one acquires the required skillset and subject matter knowledge.

There are opportunities to upskill and move horizontally and vertically into the organizations across industries making a career which is highly rewarding and relevant to this age and time. With sophisticated skills and continuous learning, employees can deem themselves irreplaceable and make a strong position for themselves in the job market as a highly preferred resource.

The myth that AI will eat up jobs is being constantly proven wrong by these innovative solutions and applications of Artificial Intelligence. The jobs will surely be displaced by leaving some roles redundant, but a lot more opportunities will open up demanding an upskilled workforce.

CAREER OPPORTUNITIES

It would not be wrong to state that Artificial Intelligence has picked up the pace to reach its prime, and is going to see an upward graph over the coming years. The career opportunities likewise are growing.



of the companies in India hiring for AI roles.



AI jobs were vacant in the year 2018

The challenge is that the supply of skilled resources in Artificial Intelligence lags behind the demand substantially. These are the jobs that have been vacant for a stretch of 12 months straight. This gap showcases a huge opportunity and promising career prospects for mid and senior-level professionals across industries.

Source: Economic Times - 2018

You can enter into the field of Artificial Intelligence and pursue a career in the same by following these five steps:

- Understand the AI career landscape
- Research and list out popular job roles in the field of AI and evaluate which suits you best
- Understand the education and knowledge pre-requisites to pursue your chosen job role
- Enrol to top online or offline resources and institutions to learn from
- Start with the job hunt to land your dream job

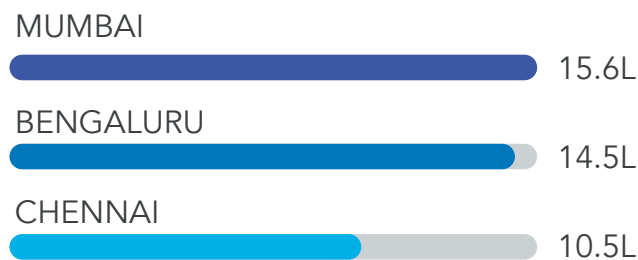
AI SALARY TREND IN INDIA

A career in Artificial Intelligence pays off really well.



The median salary of AI professionals in India

City-wise remuneration trends



Average Salary per annum (INR)

Source: Economic Times - 2018

40%
Entry level
professionals



> 6L p.a.
Salary

4%
Senior level
professionals



> 50L p.a.
Salary

60-80%
Salary
hike



Job switch in
AI
domain

20-30%
Salary
hike



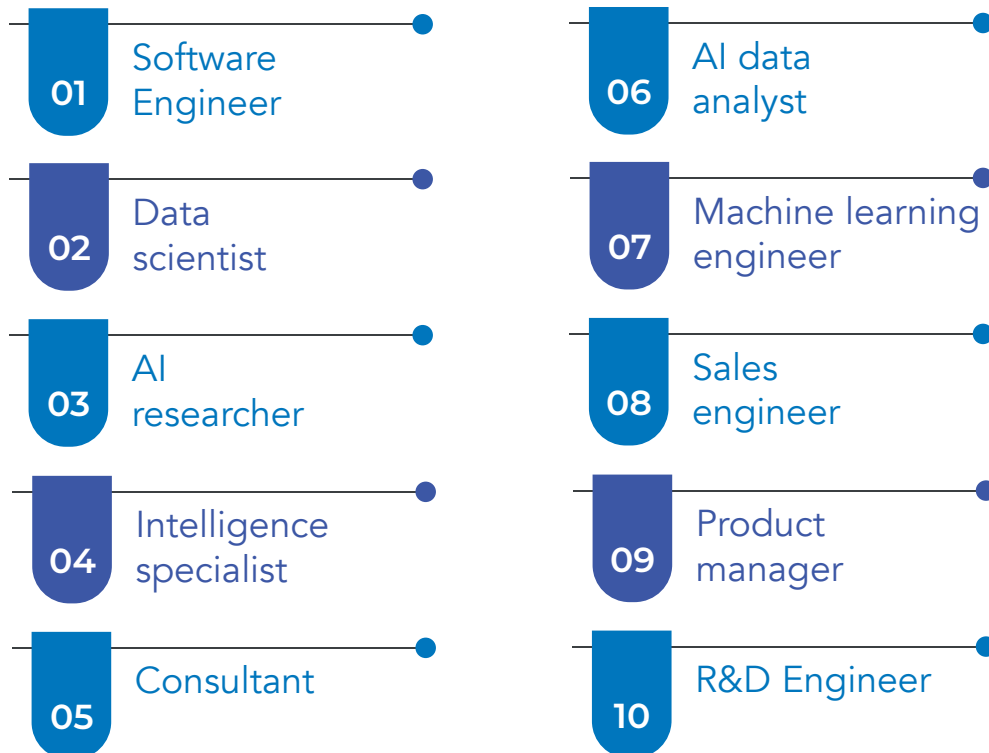
Job switch in
Other
domains

Source: Economic Times - 2018

AI JOB TITLES

MIT Sloan's research aggregated the responses of over 3000 analysts, executives, and managers across industries and deduced that 85% of them believed that AI will provide a competitive advantage to their businesses. But, on the other hand, only 20% have started to implement this technology in their own businesses. Also, the world economic forum's report forecast that AI and robots at the workplace will create 58 million net new jobs in the coming years. The landscape is wide and varied for a career in AI and professionals can expect a major shift in the quality, number, location, and permanency in AI specialist roles.

The job roles offered by companies hiring for AI roles



AI HIRING INDUSTRIES

IT

tops the race among industries that are massively hiring for these AI roles.

2.5L

new jobs in 2019 in India by IT industry.

Source: "IT hiring projections for 2019" by TeamLease

Other industries that are most likely to adopt AI and Machine Learning solutions and hence create job opportunities for experts are:



MANUFACTURING &
SUPPLY CHAIN



FINANCIAL
SERVICES



HEALTHCARE



EDUCATION



CONSUMER
& RETAIL



PUBLIC & UTILITY
SERVICES



AGRICULTURE



TELECOM

The top 10 organizations which offered most numbers of job opportunities in the year 2018 were:



(Source: Economic Times - 2018)

SAMPLE JOB DESCRIPTIONS

ARTIFICIAL INTELLIGENCE ENGINEER

Responsibilities

- Set up and manage AI development and production infrastructure
- Help AI product managers and business stakeholders understand the potential and limitations of AI when planning new products
- Build data ingest and data transformation infrastructure
- Identify transfer learning opportunities and new training datasets
- Build AI models from scratch and help product managers and stakeholders understand results
- Deploy AI models into production
- Create APIs and help business customers put results of your AI models into operations

Skills Required

- Demonstrated proficiency in multiple programming languages with a strong foundation in a statistical platform such as
Python, R, SAS, or MatLab
- Experience building AI models in platforms such as
Keras, TensorFlow, or Theano
- Demonstrated commitment to learning about AI through your own initiatives through
courses, books, or side projects

MACHINE LEARNING ENGINEER

Machine Learning Engineer responsibilities include creating machine learning models and retraining systems. To do this job successfully, you need exceptional skills in statistics and programming. The knowledge of data science and software engineering is an added advantage. Your ultimate goal will be to shape and build efficient self-learning applications.

Responsibilities

- Study and transform data science prototypes
- Design machine learning systems
- Research and implement appropriate ML algorithms and tools
- Develop machine learning applications according to requirements
- Select appropriate datasets and data representation methods
- Run machine learning tests and experiments
- Perform statistical analysis and fine-tuning using test results
- Train and retrain systems when necessary
- Extend existing ML libraries and frameworks
- Keep abreast of developments in the field

Skills Required

- Proven experience as a Machine Learning Engineer or similar role
- Understanding of **data structures, data modelling & software architecture**
- Deep knowledge of **mathematics, probability, statistics & algorithms**
- Ability to write robust code in **Python, Java and R**
- Familiarity with machine learning frameworks like **Keras or PyTorch** and libraries like **scikit-learn**
- Outstanding analytical and problem-solving skills

SKILLS REQUIREMENT

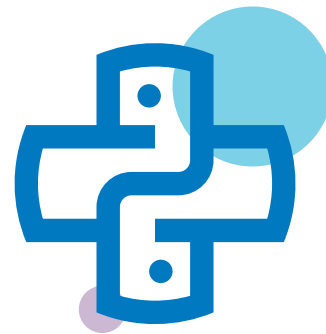
The top skills that employers seek in AI professionals are Natural Language Processing, Machine Learning, Neural Networks, Cloud Computing, Data Science, Analytics, and Pattern Recognition among others.

While the technical skills on your resume will surely land a good job in Artificial Intelligence, you cannot ignore the supporting written and verbal communication skills that are needed to convey how the AI tools and services are deployed within the business or industrial processes.

Professionals are required to be hands-on with the following tools, techniques, and programming languages:

Python

Object-Oriented Programming, Python is a very useful and robust programming language that focuses on RAD (Rapid Application Development). The ever-changing libraries are the reason that it is an ideal choice for developers working on AI projects.



The benefits of using Python are:



PREBUILT
LIBRARIES



MINIMAL
CODING



PLATFORM
AGNOSTIC



FLEXIBILITY

Java



This programming language derives a major part of its syntax from C and C++. It is fast, powerful, and secure along with easier debugging. Java is architecture-neutral and hence portable with no implementation-dependent aspects of a specification. The multi-threading feature makes it possible for a program to perform various tasks simultaneously.

The benefits of using Java are:



SCALABILITY



BETTER USER
INTERACTION



PLATFORM
AGNOSTIC



LARGE-SCALE
PROJECTS

R

Considered as a Statistical Software, R is specialized for statistics, data visualization, and data analytics with graphical tools. It has effective data handling and storage facility and runs on all platforms, being easily ported to another platform. A common application is in monitoring user experience in Social Media.



The benefits of using Python are:



OPEN SOURCE
& FREE



CAN CONNECT WITH
OTHER LANGUAGES



ADVANCED
VISUALIZATIONS

Other tools and techniques which are also important are Hadoop, Data Mining, Spark, and SAS.

SUCCESS STORIES



**SAI
VENKATESHWARAN
SRINIVASAN**
Senior technical lead

Infosys

The peer learning aspect is something that you guys should definitely be proud of. I should say that I have been able to connect with wonderful people, both technically and personally, after enrolling in the course. I am always an advocate for the quote - when you teach you learn more about what you teach. Here my peers are both teachers and students enriching each other's technical expertise to a vast extent.

The course provides a good balance of theory and practical application of different techniques covered through sessions taken by renowned faculty. It balances regular and online coursework amidst work schedules and enhanced by opportunities to engage with leading faculty and outstanding peers.



**LAKSHMINARASIMHAN
SANTHANAM**
Director - Data Analytics
and Automation



MONDAL SUDIPTA
Senior Data Analyst



The Capstone project gave me an opportunity to optimize and automate the best practices used in the industry.

ABOUT THE PROGRAM

The PGP-AIML (Post Graduate Program in Artificial Intelligence and Machine Learning) is designed with the needs of the modern workforce in mind. It is a comprehensive program that covers everything that a professional would need to launch their career in AI.

We do this by offering:

- Real-world examples and projects that help you apply the skills you've learned
- Personalised mentorship to clear your doubts and offer guidance in your learning journey
- Interacting with experienced industry practitioners to offer context

Our mentors are highly experienced professionals, working in the leading companies of the world. They will help you with career guidance, clearing your doubts about the course content, and offering industry context that helps you materialize and transform what you've learned into industry-ready skills.

Also, when you enrol in the PGP-AIML, you will solve real-world industry problems by utilizing [cutting-edge tools such as TensorFlow, Python Keras, and libraries that include matplotlib, Pandas, Numpy, NLTK, Sci-kit learn and much more.](#)

Other AI courses



PGP-ML
(PG program in
Machine Learning)



AIFL
(Artificial Intelligence
for Leaders)



DLCP
(Deep Learning
Certification Program)

ABOUT GREAT LEARNING

Great Learning is an ed-tech company that offers programs in career critical competencies such as Analytics, Data Science, Big Data, Machine Learning, Artificial Intelligence, Cloud Computing, DevOps, Full Stack Development and more.

Our programs are taken by thousands of professionals globally who build competencies in these emerging areas to secure and grow their careers. At Great Learning, our focus is on creating industry-relevant programs and crafting learning experiences that help candidates learn, apply and demonstrate capabilities in areas that are driving the future.

We are on a mission to make professionals proficient and future-ready. In the last 5 years, we have been able to deliver



to professionals worldwide

with thousands of them being able to achieve a successful career progression in leading companies such as

Microsoft, Amazon, Adobe, American Express, Deloitte, IBM, Accenture, McKinsey

and more.