greatlearning
Learning for Life

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, we can witness AI applications being used in our routine lives. Automated customer support systems, chatbots, and personalized shopping experience with product recommendations are common examples 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 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 of our lives today. 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, 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 costs and time. The vast amounts of data collected by businesses along with concepts like the Internet of Things are driving marketing decisions and improving operations and customer service.
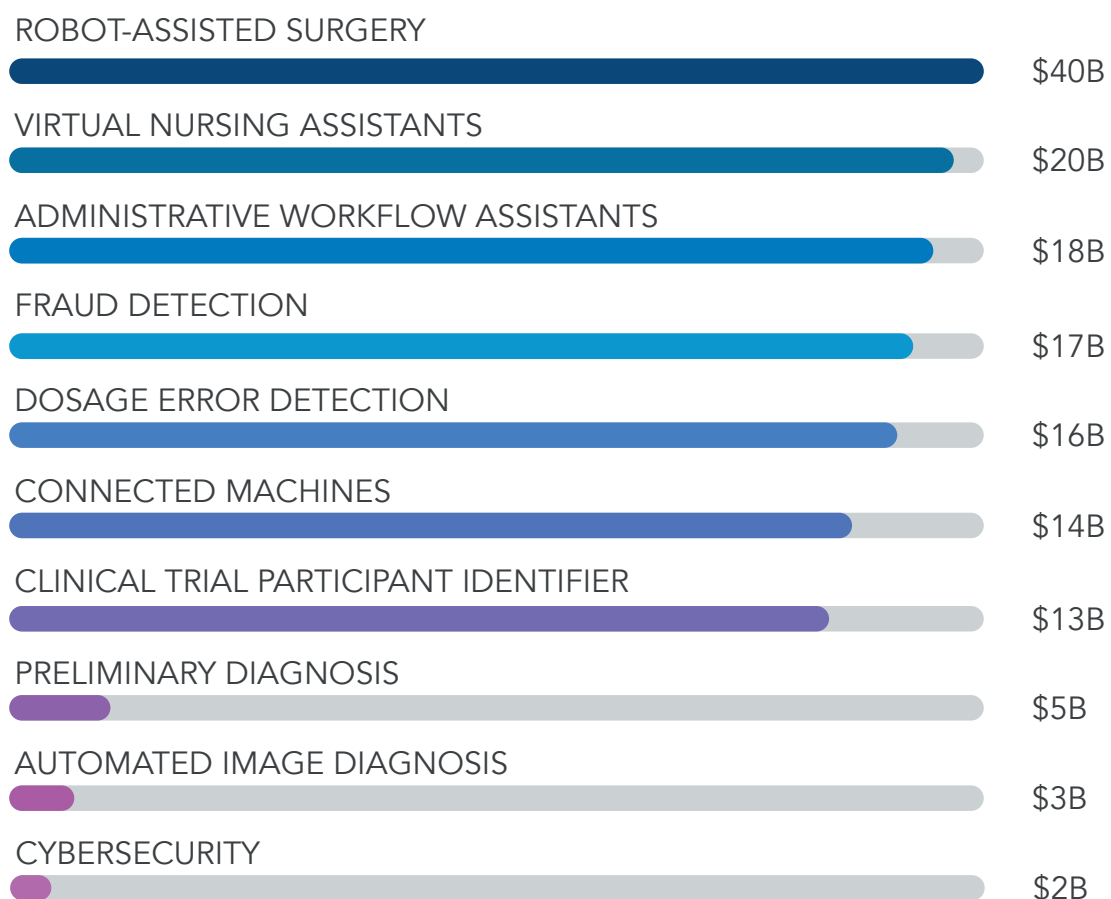
INDUSTRY APPLICATIONS
OF AI

Here are a few 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:

ROBOT-ASSISTED SURGERY
$40B

VIRTUAL NURSING ASSISTANTS
$20B

ADMINISTRATIVE WORKFLOW ASSISTANTS
$18B

FRAUD DETECTION
$17B

DOSAGE ERROR DETECTION
$16B

CONNECTED MACHINES
$14B

CLINICAL TRIAL PARTICIPANT IDENTIFIER
$13B

PRELIMINARY DIAGNOSIS
$5B

AUTOMATED IMAGE DIAGNOSIS
$3B

CYBERSECURITY
$2B

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 software 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 enable a 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 services than ever.
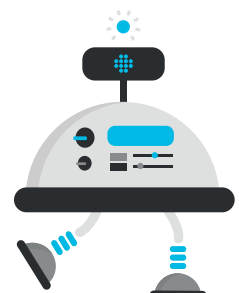
Marketing

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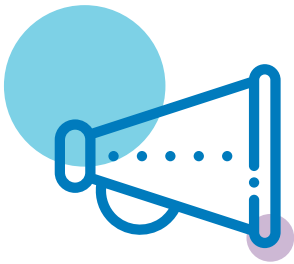
Marketing automation, programmatic media buying, propensity modelling, predictive analytics, and lead scoring are other applications where AI can leverage better results. Some Machine Learning algorithms can run through vast amounts of historical data to draw insights on the ads that performed best,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

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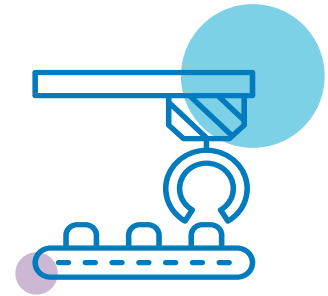
The outcome of these applications and the general acceptability of these technologies can be seen in the form of increased job opportunities and new work domains. This has created a necessity to learn new skills and move from older, redundant roles to newer, high-paying jobs, given one acquires the required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

In this age and time, there are plenty of opportunities to move horizontally and vertically across organizations and industries. With sophisticated skills and continuous learning, employees can deem themselves irreplaceable and make a strong position for themselves in the job market as highly preferred resources.

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

'Artificial Intelligence Specialist' was **#1 on LinkedIn's 2020** Emerging Jobs Report

AI specialists have seen a **74% job growth** annually in the past 5 years.
(Source: LinkedIn Emerging Jobs Report, 2019)

By 2020, AI will create **2.3 million jobs** and eliminate 1.8 million jobs.
(Source: Gartner, 2017)

AI could add as much as **$15.7 trillion to the global economy** by 2030.
(PwC, 2019)

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 in relevant programs to gain the necessary skills and knowledge
- Start with the job hunt to land your dream job

AI SALARY TRENDS ACROSS THE GLOBE

Average salaries for 'Machine Learning Engineer'

United States
$121,635

Canada
CA$ 97,000

United Kingdom
£57,243

France
€ 45,249

Germany
€ 65,061

Spain
€35000

Mexico
Mex $ 421,469

Brazil
R$ 110,000

Japan
¥ 7,561,365

China
¥450,000

India
₹14,30,000

United Arab Emirates
AED 359,722

Singapore
S$ 92,000

South Africa
R 414,149

Australia
A$ 108,375

New Zealand
NZ$80,000

Sources: Glassdoor.com, PayScale.com, Indeed.com
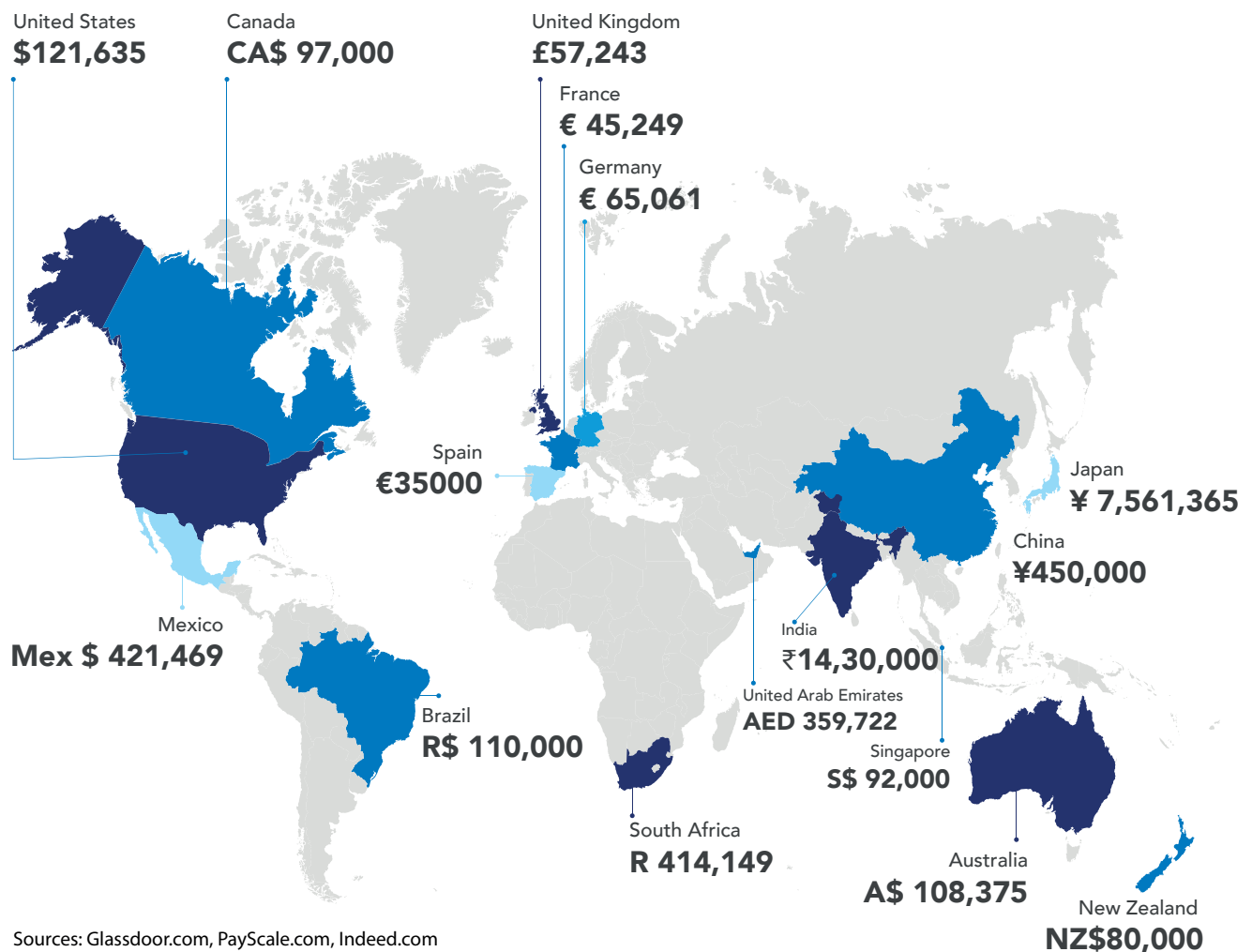
TOP 5 AI JOB TITLES WITH THE HIGHEST SALARIES

- Machine Learning Engineer
- Data Scientist
- Computer Vision Engineer
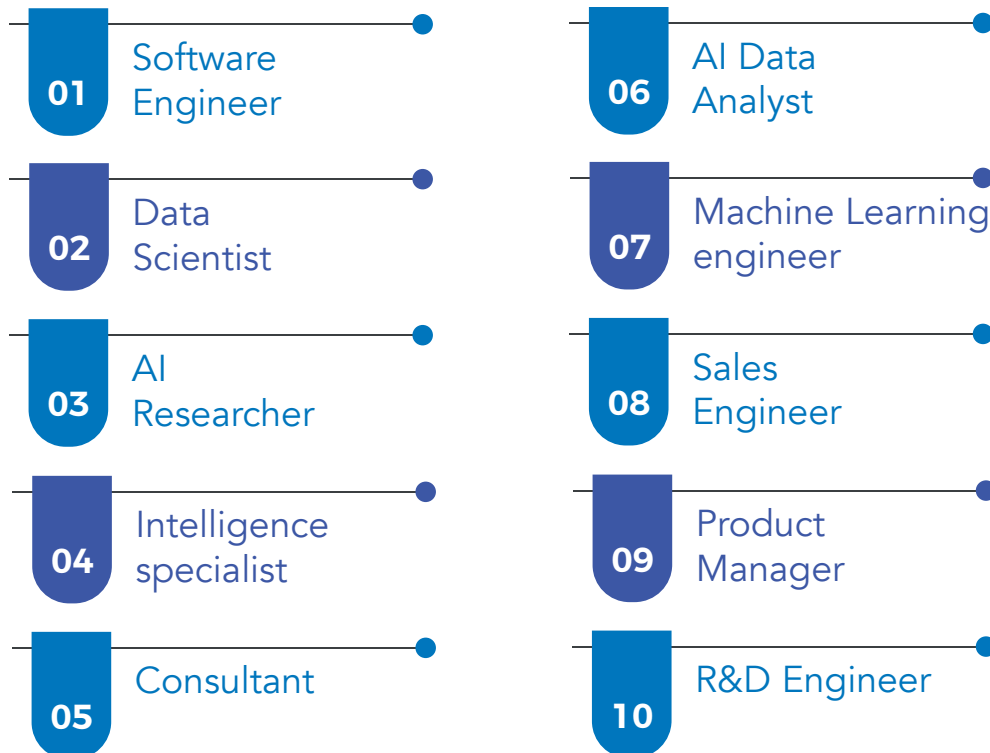- Data Warehouse Architect
- Algorithm Engineer

(Source: Indeed, 2019)

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 forecasts 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

01 Software Engineer

02 Data Scientist

03 AI Researcher

04 Intelligence specialist

05 Consultant

06 AI Data Analyst

07 Machine Learning engineer

08 Sales Engineer

09 Product Manager

10 R&D Engineer

TOP INDUSTRIES FOR **AI AND MACHINE LEARNING**

- ★ Manufacturing
- ★ Supply Chain Management
- ★ Healthcare
- ★ Education
- ★ IT Service Management

- ★ Financial Services
- ★ Energy & Mining
- ★ Agriculture
- ★ Retail & eCommerce
- ★ Telecom

LEADING ORGANIZATIONS FOR AI

(Sources: Towards Data Science Blog, 2019; US News & World Report, 2019)

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

<u>Machine Learning Engineer</u> 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 REQUIRED

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 help you 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.
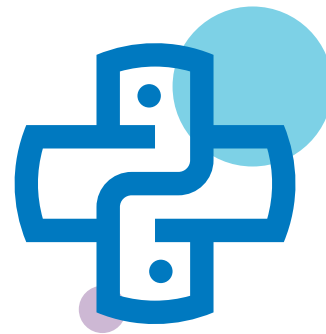
The benefits of using Python are:

| PRE-BUILT 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 on Social Media.

The benefits of using R are:

| OPEN SOURCE & FREE | CAN CONNECT WITH OTHER LANGUAGES | ADVANCED VISUALIZATIONS |

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

POST GRADUATE PROGRAM IN
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

TEXAS McCombs
The University of Texas at Austin
McCombs School of Business

greatlearning
Learning for Life

The Post Graduate Program in Artificial Intelligence and Machine Learning (PGP-AIML) is a 6-month-long comprehensive program by The University of Texas at Austin and Great Learning.

Designed to enable career outcomes in AI and Machine Learning,the program uniquely combines a comprehensive curriculum, covering the most widely-used tools and techniques in the industry, with a hands-on learning approach. A structured learning journey keeps you on track throughout as you achieve your weekly learning milestones with your mentor and benefit from their rich professional experience.

Following a "learn by doing" pedagogy, the program offers you the opportunity to apply your skills and knowledge in real-time every week through interactive mentor-led practice sessions with practicing AI/ML experts from leading companies. This is supplemented by industry-scale hands-on projects to build your portfolio.

On a whole, the program empowers you with the skills, body of work, and job market insights you need to find the right career opportunities or lead AI and ML in your current organisation.

All this comes with the credibility, global advantage, and academic leadership of The University of Texas at Austin.

LEARN MORE AND APPLY

Contact Details

📞 +1 (512) 647-2647

✉ aiml.utaustin@mygreatlearning.com

🌐 www.mygreatlearning.com/pg-program-online-artificial-intelligence-machine-learning