Introduction to Artificial Intelligence and Deep Learning Program

An eleven-week program covering Artificial Intelligence and Deep Learning for IT professionals

DePaul University's Introduction to Artificial Intelligence and Deep Learning Program is designed for IT professionals who want to understand the fundamental principles of Artificial Intelligence and Deep Learning and be able to apply them to their businesses. The program is suitable for data scientists and analytics professionals wanting to make the transition from Business Intelligence to Artificial Intelligence and to bring their Machine Learning knowledge to the next level—Deep Learning. The program focuses on Artificial Intelligence, Cognitive Analytics, Machine Learning, Deep Learning, Natural Language Processing (NLP), Knowledge Engineering, Digital Voice Assistant/Chatbot, Image/Video Recognition, Robotics Process Automation (RPA), and Augmented Reality. In addition, the program also covers Big Data analytics techniques that are used in the industry relating to Cloud, Mobile, and Internet of Things (IoT).

Program content consists of lectures and demonstrations complemented with hands-on labs. Reading assignments, case studies, group discussions, and projects will be assigned. The program will prepare students with the necessary skills to create efficient AI and Machine Learning applications to solve business problems and improve business processes.

In order to maximize learning, students will be required to bring their own laptop computer to every class session. Several Cloud-based products for AI and Deep Learning will be explored. While access to most of these Cloud services will be provided to students in class, there may be some Cloud services that are only accessible via the use of the student’s own credit card. Students should expect to spend a small fee to access these services.

YOU WILL BE ABLE TO:

- Identify basic concepts, terminology, models and methods in the field of AI
- Develop Artificial Intelligence applications using Cloud-based tools
- Discover and experience various solutions provided by AI
- Gain insight in the use of AI and advanced analytics to identify customer behavior patterns and make the best use of available data
- Work with data to build and train machine learning models that power interactive bots
- Gain real-world experience through lab work and a project to demonstrate the skills learned
- Use different bot frameworks to implement conversational bots and Digital Assistants
- Use various Deep Learning algorithms and tools to build models to solve business problems
- Understand the capabilities provided by various Big Data Analytics frameworks integrated with different Artificial Intelligence and Deep Learning systems and APIs offered by Google, Amazon, Microsoft, IBM, etc.
**INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND DEEP LEARNING PROGRAM**

**CURRICULUM**
Each student will have a flexible environment to access different tools, along with sample code and scripts to learn best practices and real-world scenarios. In order to maximize learning, students will be required to bring their own Apple or Windows laptop to every class session. Classroom lectures and demonstrations will be complemented by reading assignments, hands-on exercises, case studies, and projects. The final class project will be the completion of an Artificial Intelligence or a Deep Learning application.

**ARTIFICIAL INTELLIGENCE OVERVIEW**
Introduction to Artificial Intelligence (AI) concepts. Using a comprehensive set of flexible AI services to create the next generation of applications using cloud computing and mobile devices powered by AI.

**BOTS AND DIGITAL ASSISTANT**
Use pre-built APIs, such as Cognitive Services and Conversational AI with Bot tools, to build custom Chatbot. Use of Artificial Intelligence technologies for developers to create Voice Digital Assistant solutions easily and with maximum productivity.

**KNOWLEDGE ENGINEERING**
Knowledge engineering is a field of AI that tries to emulate the judgment and behavior of a human expert in a given field. It heavily relies on data, rules and reasoning mechanisms to create expert decision making solutions. Reinforcement Learning will be covered along with different real-world scenarios.

**NATURAL LANGUAGE PROCESSING (NLP)**
Interaction between computers and human (natural) languages including speech recognition, natural-language understanding, and natural-language generation. Use of cloud-based tools to demonstrate text-to-speech, speech-to-text and language translation.

**VIDEO AND IMAGE RECOGNITION**
Build automatic image/video recognition systems. Use of facial recognition technology, deep learning algorithms and image processing to smartly identify objects.

**MIXED AUGMENTED REALITY**
The key concepts and techniques of Mixed and Augmented Reality will be covered along with some business aspects of augmented reality: the AR market, the potential applications and the value chain.

**ROBOTIC PROCESS AUTOMATION (RPA)**
Provide an overview of robotic process automation industries, applications, benefits, challenges, and risks.

**COGNITIVE ANALYTICS**
Cognitive Services expands on machine learning APIs and enables developers to make applications more intelligent, engaging, and discoverable. Build apps with powerful algorithms to see, hear, speak, understand, and interpret personal needs using natural methods of communication.
DEEP LEARNING
Develop and evaluate different Deep Learning algorithms, such as Convolutional Neural Network (CNN) and Recurrent Neural Network (RNN). Apply Deep Learning algorithms to build complex models.

MICROSOFT ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Building intelligence into your solutions with the Microsoft AI platform, including pre-trained AI services like Cognitive Services and Bot Framework, as well as deep learning tools like Azure Machine Learning, Visual Studio Code Tools for AI, and Cognitive Toolkit.

AMAZON ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
Launch the AWS Deep Learning AMI along with machine learning models leveraging GPUs. Build conversational interfaces using Amazon Lex. Automate image and video processing using Amazon Rekognition.

IBM WATSON ANALYTICS
Acquire hands-on experience with IBM Watson Analytics along with use cases across a variety of industries.

GOOGLE TENSORFLOW
A quick introduction to Deep Learning fundamentals using Google TensorFlow. Use complex algorithms to develop deep learning models, train models and integrate trained models into applications.

GENERAL INFORMATION

ADMISSION
The program is suitable for data scientists, business analytics and other IT professionals who already have a basic understanding of Machine Learning concepts. Basic experience with Python programming is also required. Experience using Cloud services is assumed. In addition, students must bring their own laptop computers running either Windows or Mac OS to class.

A substantial commitment of time is required for this intensive course of study. Final admission will be determined by the admissions committee on the basis of an applicant's overall qualifications, including work history and educational background.

FACILITIES
To promote the learning process, the Institute maintains special-purpose laboratories as well as dedicated classrooms equipped with state-of-the-art audio/visual equipment.

In addition, the college’s unique Course OnLine (COL) technology allows students to replay classes over the Internet. COL captures the essential elements of our on-campus classes—the lecture itself and information displayed in class and written on the board—incorporating into a flexible interface, available online a few hours after the class session ends.

SCHEDULE
The Institute offers one section of the program each quarter. Classes meet one evening per week. The option to take the program entirely online is also available.

FACULTY
The program is taught by Marco Chou. Mr. Chou has been an adjunct lecturer at DePaul University for many years, and has more than 30 years’ experience in the IT industry specializing in database administration, information management, cloud computing and big data analytics. Since 2013 he has developed Big Data Analytics and Data Science technologies programs for DePaul’s Institute for Professional Development. Mr. Chou will be available throughout the program both in person and through electronic mail.
The college, through its School of Cinematic Arts, School of Computing, and its School of Design, offers a variety of programs at the undergraduate and graduate levels. Over 3,000 students are enrolled in the college’s bachelor’s programs and about 2,000 students are enrolled in the master's and Ph.D. programs making the college’s graduate program one of the largest in the country. The college offers close to 400 courses each quarter, many in the evening, and primarily in the Loop and Lincoln Park Campuses. Most of the degree programs are also available exclusively online.

**Offerings at the undergraduate level include:**
- Animation B.A. / B.F.A.
- Computer Science B.S.
- Cyber-Physical Systems Engineering B.S.
- Cybersecurity B.S.
- Data Science B.S.
- Film and Television B.A. /B.F.A.
- Game Design B.S.
- Game Programming B.S.
- Graphic Design B.F.A.
- Information Systems B.S.
- Information Technology B.S.
- Interactive and Social Media B.S.
- Math and Computer Science B.S.
- Network Engineering and Security B.S.
- User Experience Design B.S.

**Offerings at the graduate level include:**
- Animation M.A.
- Applied Technology M.S.
- Business Information Technology M.S.
- Computational Finance M.S.
- Computer Science M.S.
- Cybersecurity M.S.
- Data Science M.S.
- Digital Communication and Media Arts M.A.
- E-Commerce Technology M.S.
- Experience Design M.A.
- Film and Television M.S.
- Game Programming M.S.
- Health Informatics M.S.
- Human-Computer Interaction M.S.
- Information Systems M.S.
- Network Engineering and Security M.S.
- Product Innovation and Computing M.S.
- Software Engineering M.S.
- J.D./M.S. in Computer Science Technology

**Master’s of Fine Arts**
- Animation
- Creative Producing
- Documentary
- Film and Television Directing
- Game Design
- Screenwriting

**Ph.D. in Computer and Information Sciences**
- Ph.D. in Human Centered Design

**INSTITUTE FOR PROFESSIONAL DEVELOPMENT**

The Institute for Professional Development was formed by the college in 1984 to assist both individuals and businesses in keeping pace with the rapid development of computer technologies. The Institute currently offers a variety of intensive certificate programs in these areas:

- Advanced SQL
- Big Data and NoSQL
- Big Data Using Hadoop™
- Big Data Using Spark
- Cloud Computing Technologies
- Cybersecurity Risk Management
- Data Science for Business
- Fundamentals of R
- Fundamentals of Software Testing
- Incident Response and Digital Forensics
- Introduction to SQL
- iOS Developer
- IPv6
- Java™ Developer
- Modern Information Technology
- Modern .NET Web Development
- SQL Server® Business Intelligence
- SQL Server® Database Administration
- Technology and Innovation
- Web Development with JavaScript & HTML5

**APPLICATION PROCEDURE:**

Complete the enclosed application and return it with a non-refundable $40.00 application fee (check or money order made payable to DEPAUL UNIVERSITY) to:

DePaul University
Institute for Professional Development
243 S. Wabash Avenue, Room 301
Chicago, IL 60604-2300

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