

Big Data Artificial Intelligence: Deep Learning and Application

21 – 22 Mar 2019 (Thu – Fri, 9:30am – 5:00pm) (Course Code: 10006864-10)

Introduction

With the lopsided 4-1 rout by Google's AlphaGo over Go grandmaster, the easy takeaway is that artificial intelligence (AI) has achieved another milestone against humans, raising the spectre that machines may eventually replace people. This recent event receives prominent mention both in the private and public sectors. While the world is dreams of integrating this intelligent technology into Smart World and Internet of Things, even advanced technology practitioner has difficulty in applying such state-of-the-art technology in our daily life.

Deep Learning Technology is a cross-discipline of technology among Big Data Analytics, Statistics and Neuroscience Technology. It simulates how a human brain learn "Knowledge" from the real world. Some eye-popping results have shown up in addressing longstanding artificial intelligence problems.

This is a two-day course that will elaborate from the ground-up in practical ways. Starting from basic big data machine learning concept, statistics methodology, and practical program running, commercial deployment for project manager.

You will Learn How to

- Understand how this technology help in Internet of Things Projects
- Understand how this technology work with big data infrastructure
- Understanding State-of-the-art Big Data Artificial Intelligence Technology
- Learn how deep learning algorithms improve the accuracies of traditional AI algorithms
- Learn basic statistics used in Big Data
- Learn basic machine learning methodology
- How deep learning help in image recognition and object tracking
- How deep learning help in sentiment analysis
- How deep learning help in decision making such as Chess / "Go" game
- Practical Experience in writing deep learning programs

Who Should Attend

This course is designed for project managers, software developers, and statisticians. It is an advanced extension to Internet of Things and Big Data Project. Project manager, who intends to utilize Big Data Intelligence into their projects, can learn what, why and how Deep Learning works in the project; Software developers and system integrators can learn practically how algorithms and software can be written.

Prerequisites

It is highly recommended that participants possess basic programming knowledge (Python) and basic statistical knowledge to fully take advantage of this course.

Medium of Instruction

Cantonese (*English terms will be used where appropriate*)

Date & Time

21 – 22 Mar 2019 (Thu – Fri), 9:30am – 5:00pm



再工業化及科技培訓計劃 (RTTP)
認可課程

企業完成審批後，可獲最多三份之二的
學費資助。

Reindustrialisation and
Technology Training Programme
(RTTP) registered course

After approval of the funding, 2/3 of
the course fee will be funded.

Duration

6 hours per day, total 12 lecturing hours.

Course Fee

HK\$4,800

("Friends of SME One" could enjoy a 5% off discount)

Reindustrialisation and Technology Training Programme (RTTP) registered course: After approval of the funding, 2/3 of the course fee will be funded.

Course Content

<p>1. <u>Basic Knowledge in Big Data Analytics</u></p> <ul style="list-style-type: none"> • What is Big Data • What is Big Data Infrastructure • What is Big Data Analytics • Trend and History of Big Data • 4 Vs of Big Data • Examples of Machine Learning <p>2. <u>Overview of Deep Learning</u></p> <ul style="list-style-type: none"> • Big Data Technology and Deep Learning • Introduction to Machine Learning • Introduction to Artificial Intelligence • What is Deep Learning • Why Deep Learning • Explosive Emerging Trends in Machine Intelligence • Supervised and Unsupervised Learning • Blending with Neuroscience Technology • Key Enabler: Big Data and Mathematics • The Challenge of Explosive Computational Bottleneck • The Challenge of Big Data Storage and Analytics • Impact to the Smart City • Internet of Things Intelligence • Applications of Deep Learning <p>3. <u>Overview of Neural Networks</u></p> <ul style="list-style-type: none"> • Applications Examples in such as Artificial Neural Network, Recurrent Neural Network, Long-Short-Term Memory Network • Removal of Feature Engineering • Supervised & Unsupervised Learning 	<p>4. <u>Basic Working Principles of Neural Network</u></p> <ul style="list-style-type: none"> • Statistics Basics • Linear Regression • Logistic Regression • Multiplayer perception • Training and Testing DataSets • Over-fitting & Regularization <p>5. <u>Artificial Neural Network</u></p> <ul style="list-style-type: none"> • Deep Convolutional Network • Over-fitting • Perceptron Model • Forward Propagation • Back Propagation • Error Optimization and Loss Function • Differentiation Chain Rule • Activation function & Non-linearity • Sigmoid, ReLu, tanh functions • Gradient descent • Momentum & Learning Rate • Vanishing Gradient Problem <p>6. <u>Convolutional Neural Network</u></p> <ul style="list-style-type: none"> • Convolution Layer • Max & Avg Pooling Layer • Filtering and Max-Pooling • SoftMax • Dropout Technique and Over-fitting • Data Augmentation • Applications of Convolution Neural Network <p>7. <u>RNN & LSTM Network</u></p> <ul style="list-style-type: none"> • Basic Concepts of Recurrent Neural Network • Basic Concepts of Word2Vec • Basic Understanding in using RNN in Textual Analysis • Application Examples of Recurrent Neural Network and LSTM 	<p>8. <u>Deep Q Learning & Reinforcement Learning</u></p> <ul style="list-style-type: none"> • Basic Concept of Reinforcement Learning • Basic Concept of Q Learning • Basic Concept of Markov Decision Process • Use of Deep Learning in Q Learning • Bellman's Equation • Concept of Value-Based and Policy-Based Learning • Understanding on the use of Reinforcement Learning in Robotic Control • Understanding on the use of Reinforcement Learning in Playing Chess and Self-Driving Car <p>9. <u>Case Study - Integration of AI into Big Data Infrastructure</u></p> <ul style="list-style-type: none"> • Typical Infrastructure on Big Data Architecture with AI capability • Python in Machine Learning • Practical Examples of Artificial Intelligence • Practical Examples of Deep Learning <p>10. <u>In-Depth Case Studies</u></p> <ul style="list-style-type: none"> • Deep Learning in Image Processing • Deep Learning in Audio Recognition • Deep Learning in Sentiment Analysis • Deep Learning in Natural Language Processing • Deep Learning in Chess Contest & Playing Games <p>11. <u>Python AI Examples</u></p> <ul style="list-style-type: none"> • Python Examples in Spark and Tensorflow • Use of Python Spark for Data Preparation for AI Data Input • Python Tensor-flow Network Programming Examples
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Award of Certificate

Participants who have attained at least 75% attendance will be awarded a certificate of attendance issued by the Hong Kong Productivity Council.

Venue

Hong Kong Productivity Council, 1/F, HKPC Building, 78 Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong.
(Kowloon Tong MTR Station Exit C)

Trainer

Mr. LEE Chi Man, Alan graduated from the Chinese University of Hong Kong with a Master of Philosophy degree in Information Engineering and a Bachelor of Engineering degree in Information Engineering (with a First Class Honor). Before founding his company, Alan held senior management role in technology group and director position in investment bank. Alan Lee oversaw the corporate strategy, merger and acquisition, product development and production management. Prior to this, he served in investment bank and capital market on risks, production management, technology, research, analytics roles and high frequency technology positions. He has 10+years management experience in telecom, technology and investment banking industry. Alan has rich experience on sophisticated analytics and large-scale global technology project management references. Alan's companies have involved in several products and projects in big data analytic technology applying on utility, public service, retail, logistics, telecom and financial industry.

Application

To enrol, please complete the attached enrolment form and send it together with the appropriate fee to HKPC Academy, Hong Kong Productivity Council, 3/F, HKPC Building, 78 Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong.

Attention: Ms. Fannie Kwok.

[All cheques should be crossed and made payable to the Hong Kong Productivity Council.]

Participants are advised to make registration on or before 14 Mar 2019 (Thu).

Enquiries

Please call Ms. Kwok at (852) 2788-6271 or email: fannie@hkpc.org, Ms. Ho at (852) 2788-5013 or fax (852) 2190-9774
Website: <http://www.hkpcacademy.org>

About the “Diploma in Big Data Analytic Practitioner”

Participants who have completed this course **AND** the other 4 courses (listed below) **and have passed the assessment of project** will be awarded the **“Diploma in Big Data Analytic Practitioner”**:

1. Big Data Analytics: Essential for Smart-City
2. Big Data Analytics: Data Science by R for Business and Internet+
3. Big Data Analytics: High Speed Searching and Micro-Services
4. Big Data Analytics: Internet of Things Sensor Data and Time Series Analysis

Participants who complete a total 60 learning hours (any 5 workshops), with 75% attendance and pass the assessment will be eligible for the Diploma certificate. Participant shall provide the following:

1. Certificate Holder in related areas; or
2. 5 grade E in HKCEE or equivalent; or
3. 5 passes at Level 2 in HKCEE or equivalent; or
4. 5 HKDSE subjects at Level 2 or equivalent; or
5. mature student **(i)**
 - (i) **Mature student for diploma courses must be 18 years old or above and with 2 years or above working experience.**