

# INTERNATIONAL IMMERSION PROGRAMME

## AI AND MACHINE LEARNING

### Programme Overview

During this short program, we are going to introduce AI and Machine Learning and their applications to the young generation of talents. AI and ML, are the most disruptive technology of the future, since they can dramatically increase the operational performance of different businesses, as well as they explore new areas and will change our society and business models. Therefore, knowing how they work and what they are is a must for the next generation of experts.

### Learning Objectives

Over the course of these lectures, participants will gain an understanding of what AI and Machine Learning actually are and the basic principles behind them. From these fundamentals, they will then be provided with an overview of the current AI/ML trends, and their applications in modern businesses.

### How they benefit

With an understanding of AI and its application, participants will have the basic skills and knowledge to allow them to identify opportunities to improve their personal and business performance through AI. This course will also provide participants with a solid foundation to allow them to further develop their AI skillset over the course of their training and careers.

### Pre-requisites

This course is targeted toward high school and first-year college students. There are no prerequisites for this course as the material will cover the basics of AI/ML through to advanced applications. The course will be delivered in English.

### Schedule

| Day 1                                                | Day 2                                                | Day 3                                                | Day 4                                                | Day 5                                                                                                                  |
|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 3 hours                                              | 3 hours                                              | 3 hours                                              | 3 hours                                              | 3 hours                                                                                                                |
| <ul style="list-style-type: none"><li>• AI</li></ul> | <ul style="list-style-type: none"><li>• ML</li></ul> | <ul style="list-style-type: none"><li>• DL</li></ul> | <ul style="list-style-type: none"><li>• DL</li></ul> | <ul style="list-style-type: none"><li>• Wrapping up</li><li>• Mini project presentation</li><li>• Evaluation</li></ul> |

## Programme Content

|       |                                                                                                                                                                                                                                                                                                                                                                              |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Day 1 | <ul style="list-style-type: none"> <li>● <i>Lecture1: Introduction to AI</i> <ul style="list-style-type: none"> <li>○ <i>A brief review of AI History</i></li> <li>○ <i>AI Applications: State of the Art</i></li> <li>○ <i>AI, Machine Learning, and Deep Learning</i></li> <li>○ <i>Restrictions and constraints</i></li> <li>○ <i>Future of AI</i></li> </ul> </li> </ul> |
| Day 2 | <ul style="list-style-type: none"> <li>● <i>Lecture 2: Machine Learning, Applications and Case Studies</i> <ul style="list-style-type: none"> <li>○ <i>Linear Regression and Logistic Regression</i></li> <li>○ <i>Neural Networks</i></li> <li>○ <i>Applications and Case Studies</i></li> </ul> </li> </ul>                                                                |
| Day 3 | <ul style="list-style-type: none"> <li>● <i>Lecture 3: Deep Learning, Applications and Case Studies</i> <ul style="list-style-type: none"> <li>○ <i>Convolutional Neural Networks</i></li> <li>○ <i>Computer Vision Applications and Case Studies</i></li> </ul> </li> </ul>                                                                                                 |
| Day 4 | <ul style="list-style-type: none"> <li>● <i>Lecture 4: Deep Learning, Applications and Case Studies</i> <ul style="list-style-type: none"> <li>○ <i>Recurrent Neural Networks</i></li> <li>○ <i>Transformer</i></li> <li>○ <i>Natural Language Processing Applications and Case Studies</i></li> </ul> </li> </ul>                                                           |
| Day 5 | <ul style="list-style-type: none"> <li>● <i>Course Summarization</i></li> <li>● <i>Mini Projects Presentations</i></li> <li>● <i>Wrap up and Team feedback session</i></li> </ul>                                                                                                                                                                                            |

## Case Studies

*Case studies will follow the division of the course into two principal components:*

- 1. Machine Learning: Case studies will cover examples to demonstrate the basic principles and methodologies*
- 2. AI / Deep Learning: Case studies will be in the form of real-life applications in computer vision and natural language process area*

## Assignment Requirement and Evaluation Criteria

- *Mini Project: 100%*
  - *Group Verbal presentation of AI/ML mini project*
    - *High-level Approach to be taken*
    - *Expected results / Impact*