

ARTIFICIAL INTELLIGENCE AND EDGE COMPUTING (AI&EC)

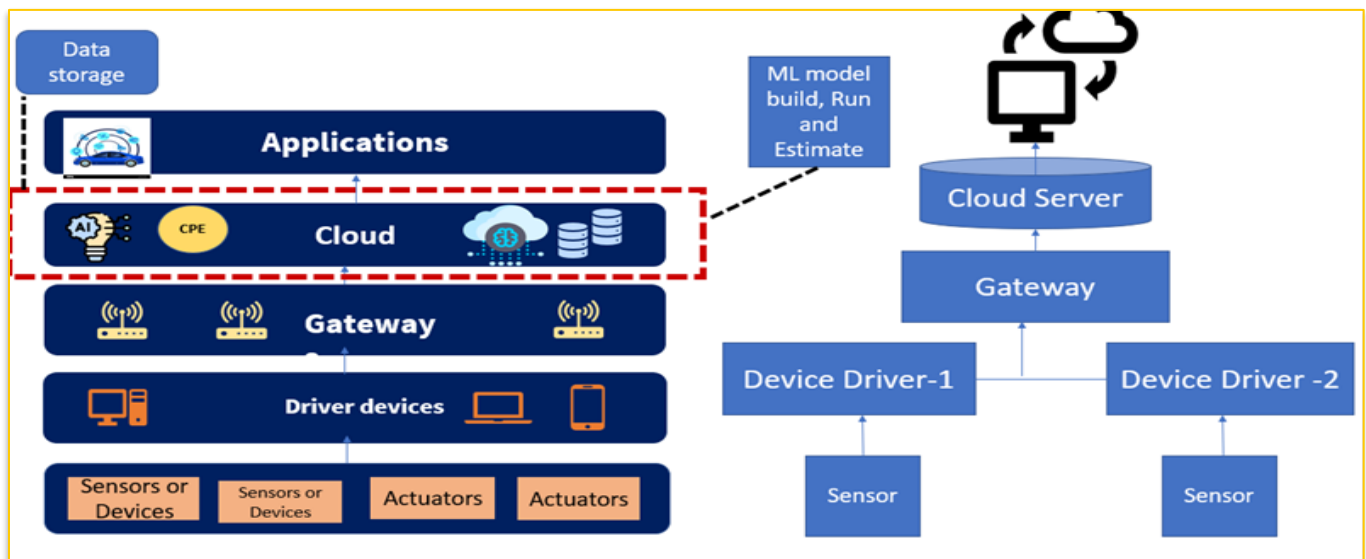
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About the Course

This course on 'Artificial Intelligence and Edge Computing' (AI & EC) is a beginners level course for aspiring engineers of Edge Computing/IoT/AI developers to acquire practice-based AI and Machine Learning skills and Edge Computing fundamentals. The course has been designed with a clear vision on future developments of Edge Computing in industrial applications along with a mission of importing all essential fundamentals for the undergraduate engineers. The course has been weaved with necessary concepts of applied mathematics and python programming to inculcate the hands-on skills of design and development of machine learning algorithms. The course contents are meticulously presented so that the learner will be able to visualize the applied areas of ML algorithms and will be able to correlate & decide the preferences among Cloud, Fog and Edge Computing. The concepts on the designing of Edge Computing Systems are provided with relevant demonstrations through Tensorflow and Tensorflowlite frameworks, which provide complete learner engagement.

During the course, the instructional model is designed to ensure that the learner has opportunities to explore modular tasks using retrospectives and to gain Higher order thinking skills. The course elevates the learner's practical experience using edge computing hardware demonstrations. The learners will also be assured with the outcomes by executing an in-course project module.



Key Topics

AI-Edge Relational model | Supervised | Unsupervised | Reinforced | Gradientescent | CrossEntropy | Neural Networks | ANN | CNN | RNN | Arduino Nano BLE | Autonomous Vehicle | Load Prediction in Substation | ML for Reservoir Engineering | DL in Construction Industry |

TOOLS: Python | TinyML | Scikit Learn | TensorFlow | TensorFlowlite | Weka | Thingspeak

Course Objective

1. Introduce composite relational model of edge computing along with Machine Learning and IoT architecture
2. Impart the ML and IoT frameworks suitable for Edge Computing
3. Elevate the learners with a knowledge and practice on tools supporting for Edge Computing solutions
4. Offer pilot training on modular development boards of Tiny ML

Learning Outcomes

On completion of the course, the learner will be able to

- Relate the AI, ML and Python programming in the context of Edge Computing
- Model Python based ML solutions for simple applications
- Develop ML and IoT frameworks for EC architecture
- Defend for various ML algorithms and CNNs for their compatibility with EC
- Estimate hardware and software tools appropriate for Tiny ML
- Adapt EC based architecture for various applications of
 - 1) Civil engineering like construction management, transport engineering, naval architecture etc.
 - 2) Electrical engineering like load prediction, multi-channel characterization etc., for substations
 - 3) Mechanical engineering domains like reservoir engineering, upstream sector of O&G Industry etc.,