LITERATURE SURVEY

3. MACHINE LEARNING BASED VEHICLE INTERNAL COMBUSTION ENGINE CONTROL (2021)

Introduction:

Analysis of state-of-the-art machine learning (ML) techniques to address the existing challenges in ICE perfor- mance, optimization, and controlis the focus of this paper. To this end, the paper includes review of models that can be used for real-time engine control and optimization. Thus, detailed Computational Fluid Dynamics (CFD) models or the ML methods for engine design is outside the scope of this paper. The focus of the paper will be mainly on review of ML methods for realtime performance optimization, onboard combustion diagnosis, and control of ICEs via data-driven and grey-box ML approaches.

The first and the second waves of artificial intelligence (AI) started in 1970s and 2000s respectively, but we are now amid the third and the largest wave of AI [43]. This is partially due to the recent progress in ML techniques, computing power, and the availability of extremely large sets of information.

Advantages:

Internal combustion engines have several advantages over external combustion engines. Because the fuel burns directly in the cylinder of the internal combustion engine, the heat loss is smaller, the thermal efficiency is higher, and fuel consumption is lower.

Disadvantages:

1.Variety of fuels that can be used is limited to very fine quality gaseous and liquid fuel.

2.Fuel used is very costly like gasoline or diesel.

3.Engine emissions are generally high compared to external combustion engine.

4.Not suitable of large scale power generation.

CORRESPONDING AUTHOR:

Masoud Aliramezani,Charles

Robert koch,Mahdi shahbakhti