Construction greener and more efficient with intelligent software

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Construction vehicles could become more efficient and environmentally-friendly, thanks to new technology developed by WMG at the University of Warwick.

Through a new Innovate UK research programme, WMG in collaboration with partners JCB and Pektron PLC are working to optimise the fuel economy of the next generation of off-highway vehicles.

Dr James Marco from WMG is leading the University's contribution to the project that aims to introduce new intelligent power systems for improved engine operation.

This could lead to significant fuel savings and fewer carbon emissions for the industry.

Dr Marco's team is analysing JCB's current fleet to better understand the opportunities for emissions reduction and intelligent control.

Today's construction industry is more environmentally-conscious than ever, and the amount of CO2 emissions released by vehicles is a significant factor in deciding which ones to use during an assignment.

As a result, it is now imperative that all construction fleets reduce their emissions - so greener, more efficient vehicles will be more in demand in an increasingly competitive market.

WMG is analysing the suitability for micro/mild hybridisation (MMH) - a feasible solution that represents a simple, low-cost implementation to create high fuel efficiency with less energy use and fewer emissions.

Many off-highway vehicles are left running at full power whilst idle for much of their life - such as telescopic handlers, heavy excavators and wheeled loaders - potentially wasting fuel with a direct impact on local air quality.

The intelligent use of MMH could provide the opportunity to shut down the engine, or shift it to lower power, during these idle periods. This would have a measurable impact upon reducing fuel consumption, CO2 output, NOx formation and particulate emissions.

WMG is researching pioneering technology which predicts when machinery requires the shift between low power and high power, thus allowing users to run the machine with the lowest fuel consumption without sacrificing their working performance.

An advanced methodology for big data capturing, compression and mining from telematics of the construction equipment fleets is provided by WMG for easily managing and analysing the performance of various machine types.

An intelligence-based decision tool has been constructed by WMG, based on the big data mining and knowledge from experts, to enable companies such as JCB to target specific machines among their fleets for hybridisation.

Dr James Marco from WMG comments on the importance of the contruction industry benefitting from cutting-edge research:

"This is very exciting project that allows WMG to leverage its extensive

portfolio of automotive research to the strategically important off-highway sector. Working with an iconic UK organisation such as JCB and Pektron PLC - a key company from their supply chain, ensures that this project will yield tangible environment benefits."

Lee Harper, Principal Engineer at JCB, comments:

"This collaborative project between JCB, WMG and Pektron is helping to identify and develop future technologies that could improve the efficiency of machines. Although in the early stages of development, the novel technology has shown great promise when tested over a variety of duty cycles."

Provided by University of Warwick