## **3rd RFP : Automatic and autonomous exploration technology** / Solution Creating Research

November 2017 to October 2020

Project title Development and field verification of remote operation of excavators and lightweight construction system capable of automatically mounting and removing attachments

Institutions : Taguchi Industries, Tokyo University of Agriculture and Technology

## **Project outline**

## Objective

In recent years, there has been an increasing demand for interior demolition of high-rise buildings concomitant with urban development as well as for employment in disaster sites. However, there are some challenges for constructions on the ground such as the weight reduction, remotization, and automation of construction machinery.

On the other hand, the machinery used in the space for the construction of a lunar base must be capable of remote and automated operation of large lightweight and unmanned equipment to reduce the cost of transportation from the Earth.

Therefore, in this study, we have used materials different from conventional ones to design and prototype lightweight components of the construction machine while maintaining the size, performance, and functions of the machinery. In addition, we have designed and prototyped new systems such as remote control, electrification, and function automation of the construction machinery, with a view to commercialize it in the future.

## Contents

- Design and prototype the body frame of a 1 ton class hydraulic excavator and its running parts with lightweight materials, carry out the evaluation, test operability, and reduce the weight of excavator.
- ② Design and prototype a 1 ton class hydraulic excavator with remote operation, electrified driving, automated attachment, and detachment system for construction machinery, and carry out performanceevaluation tests.
- ③ Design and prototype the bucket of a hydraulic excavator with lightweight material, perform evaluation test, and reduce the weight of the excavators.



