Department of Mechanical Engineering	Key words	Vibration control , Functional fluid, Adaptive control (neural net, deep learning),RF-ID,Complex system, Traffic flow

Education
Department of Science and Engineering, Mechanical Engineering, Aoyama Gakuin University
Aoyama Gakuin University Graduate School of Science and Engineering
Yokohama National University Graduate School of Engineering (Doctoral Program)

Professional Background
Isuzu Motors,Ltd.   Toyota Industries Corporation
Shizuoka Institute of Science and Technology
National Institute of Technology, Ichinoseki College

Consultations, Lectures, and Collaborative Research Themes
Vibration control issues,Application of functional fluid,Adaptive control (neural net, deep learning),Measurement of difficult measurement points using RF-ID,Complex system problems such as traffic flow

e-mail address
tsuchiya@fukui-ut.ac.jp

Doctor of Engineering / Professor

Takashi Tsuchiya

Main research themes and their characteristics

「Study of Piston Temperature Measurement System used RF-MEMS」

It is extremely important to save energy for prevention of global warming. New generation automotive engine is made up by high compression ratio and low friction by small engine for better fuel consumption.

However with increasing higher compression increasing the piston's temperature exceeds a melting point of the aluminum and a piston is damaged. The measurement of good piston temperature of the precision is very important for higher compression piston and good fuel consumption.

In this paper we made the measurement of good piston temperature of the precision by RF-MEMS systems.
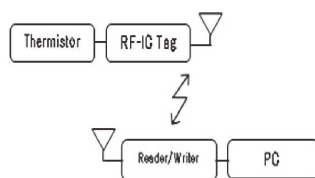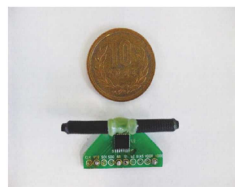

Fig.1 System configuration chart
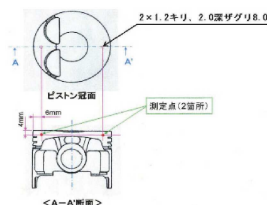

Fig.2 Sensor tag and antenna

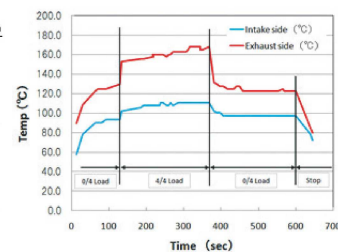Fig.3 Thermistor installation position

Fig.4 Test outcome in engine

「Using Mutual unit type Neural Networks for the Engine Failure Diagnosis System」

The diesel engine has a high thermal effiency, but the serverity of emission restriction is increasing. In such a circumstance , various exhaust decrease devices is studyed. But several exhaust device is affected by a fuel property. In this study, we examined possibility of fuel kind distinction by mutual unit type neural networks work system using diesel fuel, kerosene and heavy oil.
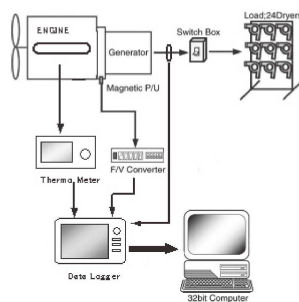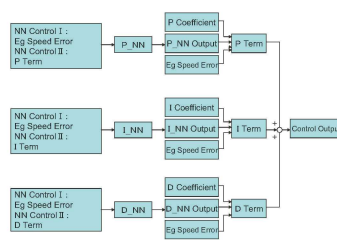

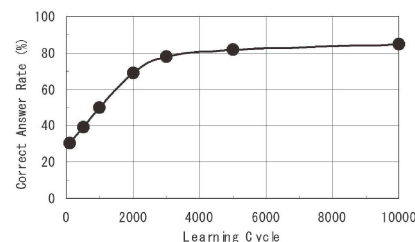Fig.5 Experimental Setup

Fig.6 PID+NN Engine Control Model

Fig.7 Neural Network Output Data

Major academic publications

Takashi Tsuchiya and Naoya Fujiwara
"Piston Temperature Measurment System Using RF-MEMS"
SAE International Technical Paper Document Number: 2007-08-0510(2007)

Takashi Tsuchiya, Kenichi Mitsuhashi, Toshihiko Shiraishi and Hiroshi Sasaki
"Revolution Control for Diesel Engine by Neural Networks"
SAE International Technical Paper Document Number: 2004-01-1361(2004)