## Gibbal Center of Excellence for Mechanical Systems Innovation

## Development of Fluid-flow and Aeroacoustics Simulation Software and Innovation of Industrial Design

Project Promoter: Chisachi Kato (IIS•Mech. Eng. Dept.), Collaborator: Katsuhiko Nishimura

Our laboratory is promoting: research and development of simulation software for the predictions of fluid-flow, heat transfer, aeroacoustics and structural vibration that runs on high-performance computing environment, validation studies through collaboration with industrial partners, and research and development of next-generation industrial design systems

R&D of massively-parallel simulation software for fluidflow, heat transfer, acoustics and vibrations





Implementation of voxel mesh



Identification of aeroacoustics sources by DNS

1.E+00 1.E+00

computing performance

Validation studies of developed software through collaboration with industrial partners



Drag reduction by control of dominant turbulent eddies (Toyota Motors)





Prediction of heat transfer in a server (Fujitsu)

Prediction of fluctuating fluid flows (JAXA)

List of related government and consortium projects

"Research and Development of Innovative Simulation Software" in Construction of next-generation IT infrastructures sponsored by MEXT (2008-2012)

"Industrial Innovation" in strategic research program for the high-performance computing infrastructure (HPCI) sponsored by MEXT (2010-2014)