

TAKEMOTO LAB.

Optimal Design of Hydrogen Tank by Machine Learning



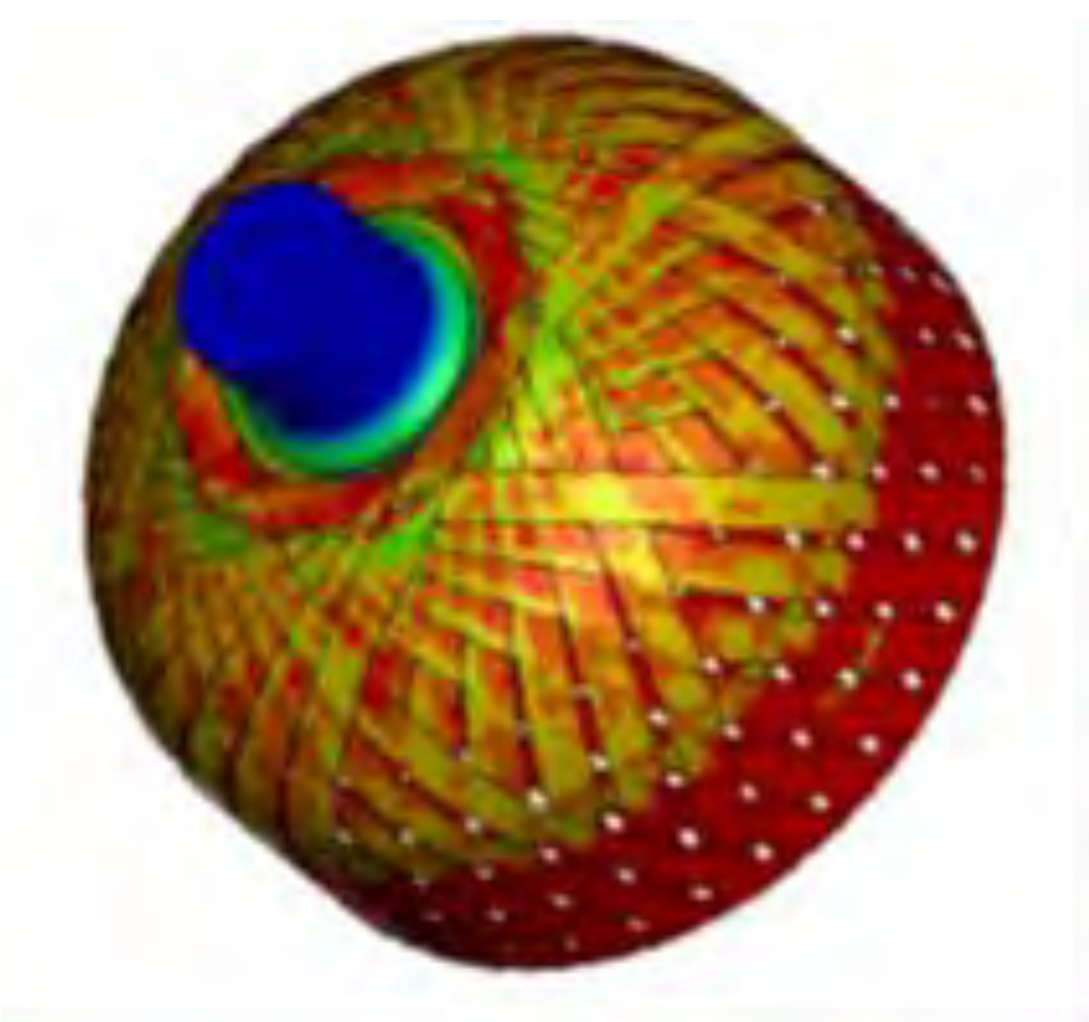
Department of Fundamental Engineering

AI Design Engineering

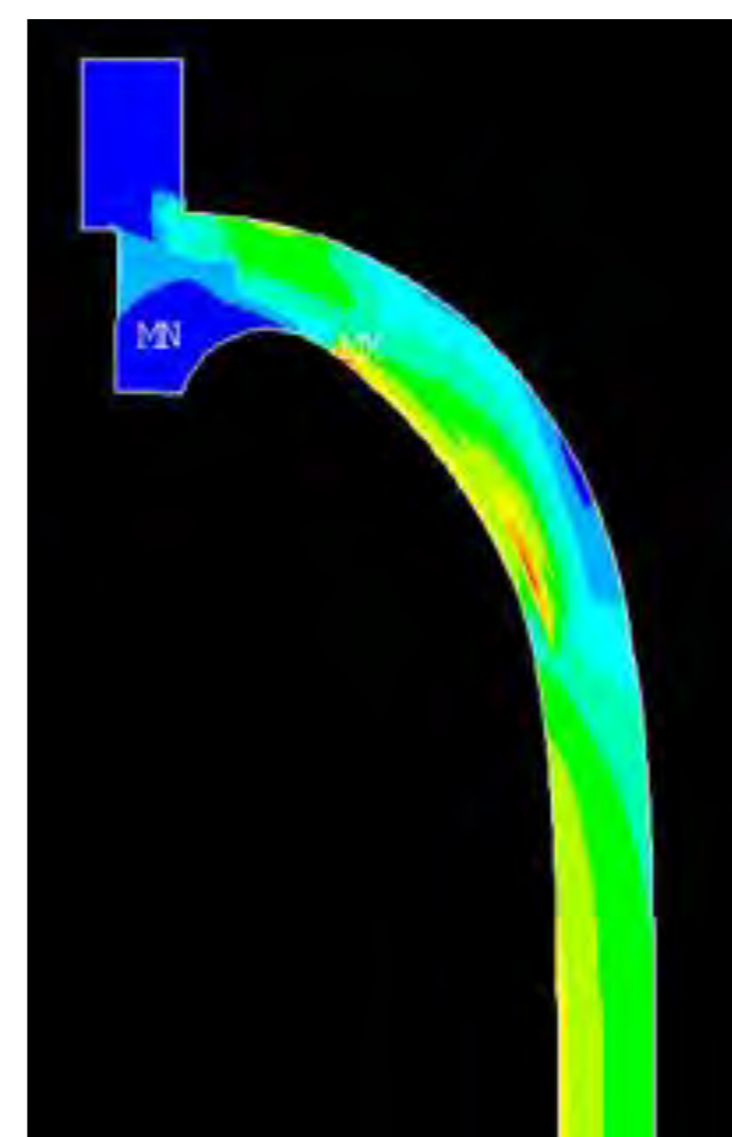
<http://www.young.iis.u-tokyo.ac.jp/>

In order to spread high-pressure hydrogen tanks made of carbon fiber reinforced plastic (CFRP), which are essential for a hydrogen society aiming for a decarbonized society, we investigate design method of innovative tank of light weight and low cost.

- Two-scale analysis, that is, mesoscale model simulation representing complex fracture phenomena of CFRP combined with macroscale model simulation realizing high-speed calculation is developed for utilizing large amounts of machine learning data.
- Development of optimal tank design system that searches for rational solution in the affordable time by means of machine learning data.
- Identification of innovative tank structure by the optimal tank design system.



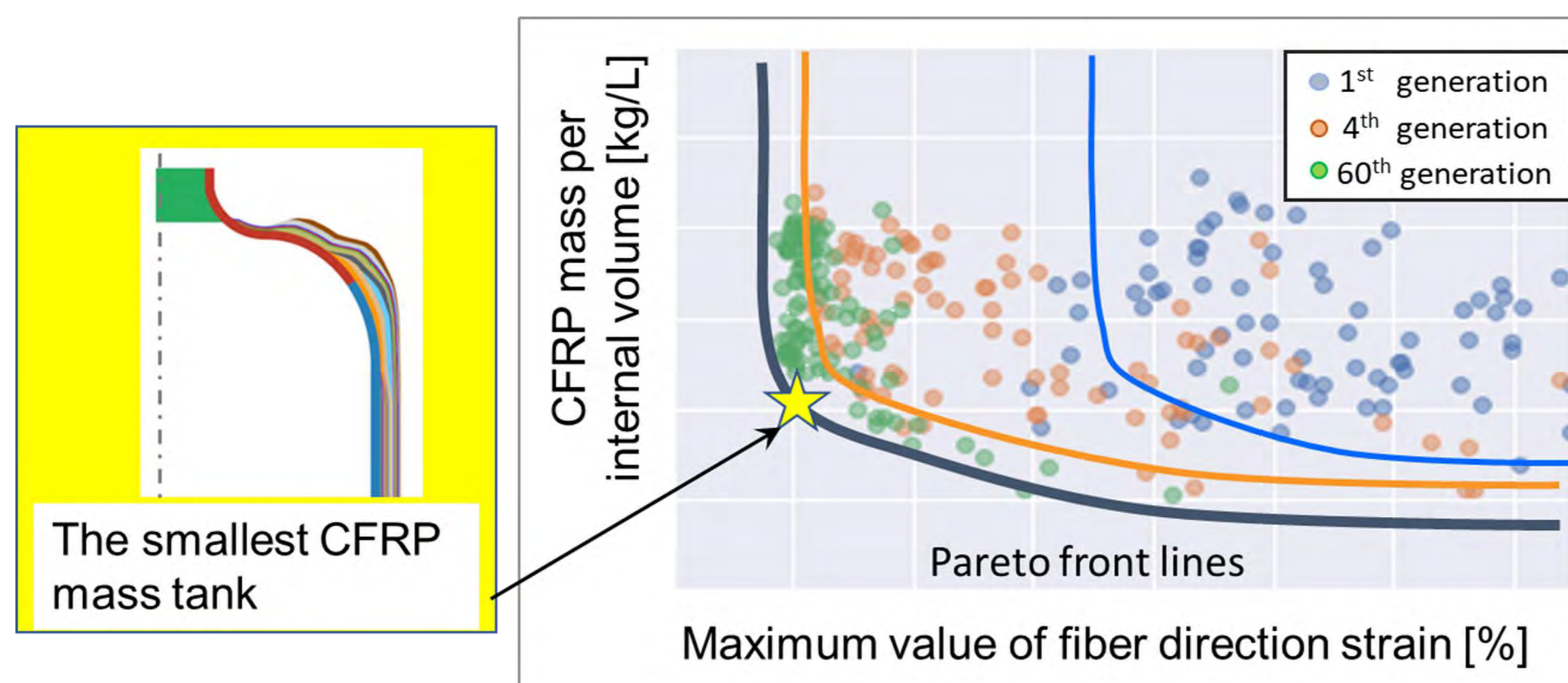
Mesoscale model
simulation of high
pressure hydrogen tank



Macroscale model
simulation of high
pressure hydrogen tank



Validation of
simulation by tank
burst test



Search for optimal tank by machine learning*

*Joint research with SUPWAT Inc. under NEDO's "Common Problem-Solving Industry-Academia-Government Collaborative Research and Development Project for Rapidly Expanding Use of Fuel Cells, etc."