



Optimization Control with CFD Simulator and Its Application to The Industrial Field

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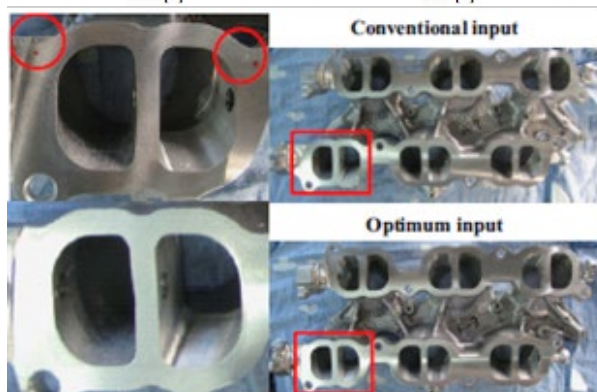
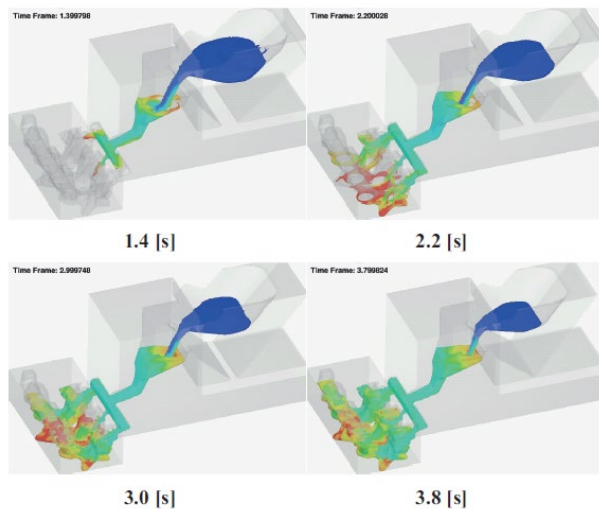
Research Fields Robotics, Foundry, Optimization control

Keywords Optimization, CFD simulator, Pouring

● Research Outline

Optimization control of the pouring machine to improve the quality

A tilting-ladle-type automatic pouring machine is used for aluminum gravity casting in manufacturing processes, and its pouring speed is set by workers through trial and error. Therefore, it is difficult to realize pouring that allows high-quality casting and high process yield. In this study, the optimum pouring control input is calculated by CFD analysis in order to prevent product defects that form during aluminum gravity casting. As a result of optimizing pouring control input using GA, optimum pouring control input realized liquid level control and its validity in mitigating product defects was seen through a real machine pouring experiment.



Trajectory planning for manipulator considering spilling avoidance

In the near future, there will be a significant problem obtaining workers in the fields of welfare and nursing care because of a labor shortage. To solve this problem, many welfare robots, such as an upper extremity motion assistance robot and a meal assistance robot, have been studied. Specifically Patients who have difficulty swallowing or weak sucking ability require a liquid diet, and there is thus a strong need for the development of a meal assist robot that can avoid spilling of the liquid. This purpose is to design a transfer control system for manipulator that incorporates spilling avoidance. In order to avoid spilling of the liquid, a spilling model was evaluated by using a CFD simulator. As a result, spilling avoidance control was realized.

