Advanced controlling methodology for Hover craft maneuverability

Sasiranga De Silva, Kishan Isuru Talawatta, W. J. A. Jayasuriya, R. K. Janaka, K. M. N. chathuranga
sasiranga@gmail.com, kitsooftlk@gmail.com, jayaniuom2010@gmail.com

A hovercraft is a type of an air cushion vehicle (ACV) capable of travelling on both land and on water. Although it utilizes many of modern technologies it requires an advanced maneuvering system to achieve optimized performance. Typically, turning a hovercraft is done by directing the thrust air flow through steering rudders placed at the rear. The subsequent momentum generated is used to maneuver the craft. Both engine and rudders are operated manually from the cockpit.

A major disadvantage of a hovercraft is poor handling. Another disadvantage is that, generally hovercrafts are brought to a stop by reducing the power supplied to the engine, thus reducing the forward momentum. Typically this will not be enough to slow down or stop the craft in short distances. This makes maneuvering over different terrains, a difficult task to the driver. These drawbacks limit the quality of this useful conveyance. The suggested solutions to overcome this issue must all be applied manually. Hence the need of an advanced automated controlling methodology for Hovercrafts maneuverability is highlighted.

Many characteristic parameters must be changed according to conditions of the environment to achieve optimum handling performance. A driver may find it laborious to process so many data simultaneously in a real time situation. A control system linked with a Human-machine interface would optimize handling and increase efficiency. As an initial step, a prototype will be tested for its structural and aerodynamic properties. Further experiments will be carried out to gather data on proposed steering dynamics. A dynamic mathematical model will be implemented using this data, and it will be organized and embedded in the RTOS (Real Time Operating System) as an optimization process for maneuverability. The new controlling methodology for hovercraft maneuverability with the use of advanced control systems will make it more desirable for the user.

Key words**:** *Hovercraft, maneuverability, RTOS, Handling, steer*