ABSTRACT

The report aims to describe the visualisation of flow pattern of a pitching and heaving hydrofoil using analytical techniques. A pitching and heaving hydrofoil is considered as a transmutation of the interaction of aquatic animals' tails and wake. It develops thrust equal to the drag acting on the body to reduce hydrodynamic drag. Specifically, the report is a computation of lift, drag and pressure in a hydrofoil for various incident angles. The results of the report can provide accurate details to enhance the aerodynamic efficiencies of bodies. The flow is visualised using openfoam .

Problem Statement

For a steady state turbulent flow, analyze the pressure distribution of flow of fluid across a pitching and heaving hydrofoil for various Strouhal numbers. From the obtained results, visualize the pattern of flow in such cases and articulate the concurrence with drag reduction in a steadily swimming fish. Calculate the strouhal number when the thrust and drag of a hydrodynamic foil are balanced.