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Determination of Optimal Structural Parameters of Triangular Prism–Shaped Vortex Generator for Using at Domain of Low Reynolds Number

O Chol Hwan[*], *Jong Ji Song*

College of mechanical science and technology, Kim Chaek University of Technology, Pyongyang, DPRK
[*]Corresponding presenting author: Email: och831017@star–co. net. kp

The present paper describes the design method to extend the measuring range of the vortex street flow meter. The shape of vortex generator was triangular prism–shape and according to change its structural parameter the performance of it is estimated by using CFD analysis.

While constructing triple BP neural network of which entrance layer is the structural parameter of the vortex generator and exit layer is CFD analysis result, heredity algorithm is used in the optimization method for using in the low Reynolds domain which its pressure loss is minim.

This paper is used simulation data of CFD numerical simulation as study data of BP neural net.

BP neural net of which entrance layer is structural parameter of generator and exit layer is minimum Reynolds number and resistance coefficient get by CFD numerical simulation result.

Here use triple BP neural net of which interlayer is one, cells of it m=4.

The relation between entrance layer and exit layer is constructed by neural net structural design command *newff* of MATLAB7.5 and used interlayer is one, cells of it m=4, the function between entrance and inter layer is *tansig* function, exit is *purelin* function, study mode is *trainbfg* mode.

Progressing optimum exploration by using heredity evolution algorithm solution tool–Genetic Algorithm Tool we decided reasonable structural parameter of triangular prism–shaped vortex generator.