

A fuzzy logic based model computes cardiac output from the radial arterial pressure waveform

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Abstract

An interactive scheme for the development of a fuzzy logic based model has been implemented and applied to build a model that is able to determine cardiac output from radial arterial pressure. It was built using as input radial pressure waveforms from patients in whom cardiac output was simultaneously measured by thermodilution. The scheme was programmed in C language in an Apollo workstation under Unix. Input variables were area under the curve, ratio between systolic and diastolic pressure, and pulse frequency. To determine fuzzy sets and membership functions the authors used 149 pressure waveforms. To test the model, the authors used 6 waveforms not used in building the model. Correlation between predicted cardiac output with measured flow was 0.98.

Keywords

Fuzzy logic, Blood pressure, Input variables, Parameter estimation, Artificial intelligence, Fuzzy sets, Workstations, Cardiology, Yield estimation, Cardiovascular system.