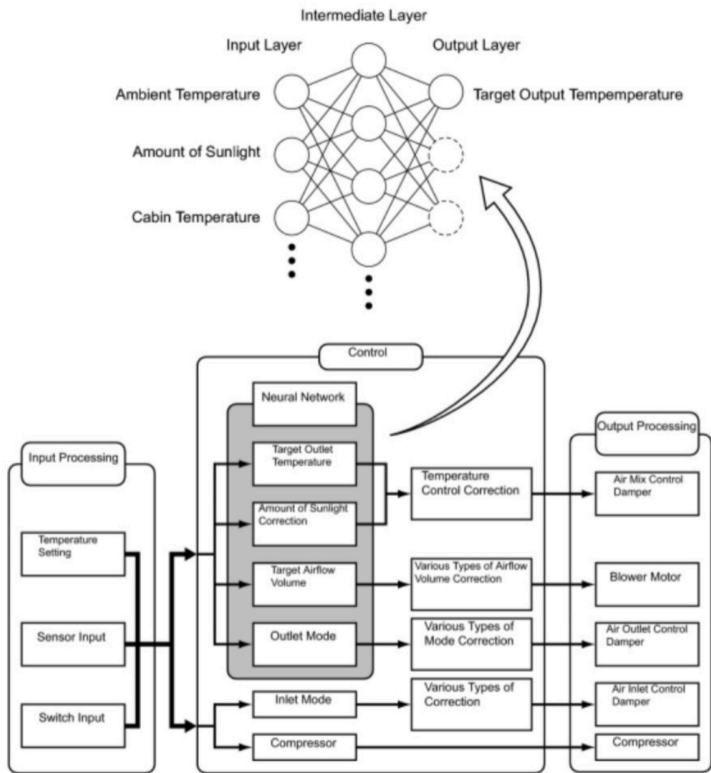## 2. NEURAL NETWORK CONTROL

- In the previous automatic air conditioning systems, the A/C amplifier determined the required outlet air temperature and blower air volume in accordance with the calculation formula that has been obtained based on information received from the sensors.

  However, because the senses of a person are rather complex, a given temperature is sensed differently, depending on the environment in which the person is situated. For example, a given amount of sunlight can feel comfortably warm in a cold climate, or extremely uncomfortable in a hot climate. Therefore, as a technique for effecting a higher level of control, a neural network has been adopted in the automatic air conditioning system. With this technique, the data that has been collected under varying environmental conditions is stored in the A/C amplifier. The A/C amplifier can then effect control to provide enhanced air conditioning comfort.

- The neural network control consists of neurons in the input layer, intermediate layer and output layer. The input layer neurons process the input data of the outside temperature, the amount of sunlight and the room temperature based on the outputs of the switches and sensors, and output them to the intermediate layer neurons. Based on this data, the intermediate layer neurons adjust the strength of the links among the neurons. The sum of these is then calculated by the output layer neurons in the form of the required outlet temperature, solar correction, target airflow volume and outlet mode control volume. Accordingly, the A/C amplifier controls the servo motors and blower motor in accordance with the control volumes that have been calculated by the neural network control.

Intermediate Layer

Input Layer   Output Layer

Ambient Temperature   Target Output Tempemperature

Amount of Sunlight

Cabin Temperature

Control

Neural Network

Target Outlet Temperature

Temperature Control Correction

Amount of Sunlight Correction

Target Airflow Volume

Various Types of Airflow Volume Correction

Outlet Mode

Various Types of Mode Correction

Inlet Mode

Various Types of Correction

Compressor

Input Processing

Temperature Setting

Sensor Input

Switch Input

Output Processing

Air Mix Control Damper

Blower Motor

Air Outlet Control Damper

Air Inlet Control Damper

Compressor

: Neural Network Operation Range

H

3. MODE POSITION AND DAMPER OPERATION

(a) Mode Position and Damper Operation