**Abstract Title:** Development of a monitoring system for personalized heating, ventilation and cooling

Lupamudra Sharma, NHRE, lupamudra.sharma@uni-weimar.de

**Motivation:** To develop a comfort level monitoring system for human with the combined effect of heating, cooling, humidity, ventilation (HVAC). According to European Commission, people in Europe spends more than 90% of their time indoors, for which an innovative solution needs to be developed for better quality of the environment and means to improve the existing system.

**Background:** Every country has different optimum level of temperature variance for an indoor setting, which will depend on the combined effect of heating, cooling, ventilation.

**Problem Statement & Research Gap:** To develop a monitoring system which can detect insufficient comfort level parameter and also to monitor the indoor air quality which will affect the comfort level. Develop a cost effective and advanced tool/sensor to better measure, assess and qualify the factors for human health and comfort. The development of networks/sensors based on sensor nodes have made a great impact in the scientific and commercial community and paving the way for “modern living” concept. Currently, the sensors and networks consider one or couple of the basic parameters like temperature and humidity. The aim of this project would be to combine all the important parameters into one integrated sensor network and optimize it.

**Approach/methodology:** The general description and guidelines for acceptable thermal environment is given by ASHRAE Standard 55 along with measuring accuracy. The monitoring approach could be short term and long term, and in case of each, different sensors need to be used. Hence the aim is to develop a specific sensor with an efficient algorithm for real-time measurement that will optimise the monitoring system. A series of indoor experiments for the developed algorithm and the sensors to be used will be performed.

**Results:** The data obtained from the sensors can be used to assess the environment and also better control the comfort elements in the space. The control system for the monitoring device should strike a balance between heating, ventilation, cooling along with consequent energy saving.

**Impact/Implications:** The condition of mind expresses satisfaction with the environment by finding a proper balance between air temperature, intensity of the sun and humidity. Consequently these factors are of utmost importance for human comfort. Even though smart building and intelligent systems are of use in the market, there is still a need to improve the existing monitoring system, with the use of wireless sensor networks and infusing all important parameters to one system.

**Conclusion:** The aim of the study is to develop an optimal living environment with low cost sensors or monitoring device but maximising efficiency and reliability.

**Keywords:** heating ventilation and air conditioning systems (HVAC), comfort system, sensors