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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

An experimental evaluation of thermal discomfort on the attention index of teenagers.

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Climatic or thermal discomfort appears when an individual factor set, which depends on the subject, and a specific and general environmental parameters set generate stress in a human body (Quayle and Doehring, 1981; Steadman, 1979a, 1979b, Thom, 1959). These environmental parameters are an energetic manifestation, which describe the physical and atmospheric conditions of a habitable environment. These parameters could be specific for each sense (thermals, acoustical, visual), or affect at all at the same time.
It is well known that the human body temperature has to remain around 36.5ºC. Fanger (2002) describes the human body as a thermic machine with inputs and outputs of energy. The human body has several mechanisms to regulate its temperature that have strong dependence on the atmospheric conditions. The heat stress appears in the human body when it can't dissipate the increase of internal temperature, because the environmental conditions like temperature, wind speed, or humidity prevent it. In these cases we could speak of climatic discomfort.
The climatic comfort has a dependence on several physical parameters: temperature, moisture, wind speed, radiation temperature of the walls, or physiological: age,, gender, race, and finally the external parameters: dress or activity (de Dear and Bragen, 1998; Cena K., 2002; Schiller et al., 1988 ; Dommini et al, 1996; Saeed et al., 1996; Fanger, 2002)
The aim of this job is to determine the influence of the climatic comfort in people's attention, specifically teenagers.
We formed 3 groups of total 250 teenagers students from 12 to 18 years old from a high school at the West Mediterranean coastline. Students from 16 to 18 years old formed the first group, the second group from 14 to 15, and the third ages from 12 to 13. In two different weather conditions (summer, with temperature of 34ºC and humidity upper to 70%, and winter, with temperatures of 20ºC and humidity around 60%), the subjects did a 20 minutes standard psychological test to evaluate and compare their attention indoor. Using dry and wet bulb thermometers we measured the temperature, the relative humidity, and the Thom index of discomfort (Thom E.C., 1959).
The results in the first and second group show a lower attention index in summer than in winter conditions in more than 93% of people. In the third group the tendency is similar, but there is a large variability.
I was also observed a increase of the attention with the age.
The attention index is greatest in girls than boys in three groups of ages. That could be caused by physiological causes: the girls are less sensible to discomfort than boys, and that affect to attention.
In a second part of this job, by using the Prudence model and Ensemble models we have obtained for Barcelona the monthly averaged values of temperature and humidity (absolute and relative) for the period 2070-2100, and for the period 2040-2070, respectively. These two models show an important increase of both temperature and humidity, and a shift of the warm and wet season (from middle spring to middle autumn). Consequently, an increase of discomfort index and a decrease of the attention index are expected for the following years.