

AII09 The Effect of Color Temperature on Visual Fatigue

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The present study was carried out to examine the effect of color temperature on visual fatigue. Eight healthy subjects of seven male and one female performed searching task under the lighting conditions of three color temperature (3000, 5000, 6700K) and constant illumination (1000lx). The subjective ratings, near point, CFF, blink rate and task performance (error rate) were obtained.

Blink rate during and after the task showed significantly higher values under the condition of 6700K. The subjective ratings on "I have dry eyes" and "I want to close my eyes" showed significantly lower values under 5000K. Judging from these results, it is considered that visual fatigue might be lowered under the color temperature of 5000K.

AII10 Measurement of Unique Color and the Application to the Study of the Sex Difference

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The combination of unique color which consists of four colors (i.e., red, yellow, green, and blue) forms the natural color system based on the recognition of human. Using the display of Barco reference calibrator (model CCID 121) which gives steady luminance at all locations and in any time, the unique colors for male and female subjects aged in 20 to 22 years are measured.

The unique colors of red, yellow, and blue do not show the sex difference, but unique color of green for males and females give the significant difference, that is, the mean wave lengths for males and females denote 545.7 ± 0.7 nm and 533.6 ± 14.4 nm, respectively. The males recognize color of green in the longer wave length by 12.1 nm than that for the females. The difference of mean wave length is larger than threshold of the discrimination in range of green whose maximum value is given to be 3.2 nm. Namely, the females recognize the color with different wave length around range of green as compared with those of males. The standard deviation of the females (14.4 nm) is larger than the value of males (0.7 nm), so that the females recognize the color of green in the wide range of wave length.

AII11 Study of Interaction between Lighting and Room Color - 2nd. Report -

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In experiment I, 15 subjects assessed the feeling of lighting for 8 environmental conditions (black or white wall \times fluorescent or incandescent lamp \times 200 or 50 lux) and 2 behavioral conditions (relaxed or reading book) over a period of 30 minutes. In experiment II, 30 subjects assessed for 4 wall color conditions (black, white, gray and silver) and 3 lighting conditions (local, whole, local+whole lighting). The SD method and factor analysis were adopted. In experiment I, the change of the evaluation for the quality was observed. In experiment II, it showed a tendency that the highest evaluation was observed when the wall color condition was white. The effects of wall color difference became smaller under the local lighting condition.

AII12 Environmental Evaluation using Acoustical Fluctuation Characteristics

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Recently, fluctuation phenomenon has been focused as an important factor of evaluating acoustical environment, although several key problems on evaluating acoustical fluctuation still remain.

This paper points out important problems of evaluating acoustical fluctuation and presents some ideas of the evaluation methods first, then shows measured fluctuation characteristics for several sound sources; classical musics, popular musics, sea wave sounds, stream sounds and pink noises.

Four frequency ranges of regression analysis (L, M, H, W) were examined. Fluctuation coefficients obtained by the range of M (0.05-0.5 Hz) or H (0.1-1.0 Hz) expressed fundamental tendencies of the sound source groups well.

Fluctuation center M and fluctuation size SD were observed. New fluctuation index SD/M (normalized fluctuation size) expressed individual characters of the sound sources clearly.

AII13 Eye movement in searching a character shown on a CRT-display

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Some applications for new interfaces of an input device using eye movement have been proposed. One interface consists of many characters which are shown on a CRT-display. The character user of the interface would like to input is selected by eye gazing. Therefore, we had to detect and define a gazing position and a gazing period. However, there were some problem in this interface. One problem was a error occurred in detection of the gazing period. We found the error was due to an unconscious pause of eye movement.

The purpose of this study is to analyze the characteristics of the unconscious pause for eliminating the error. We observed the eye movement in searching one character from another rapidly, and analyzed the moved angle, the moving time, and the mean velocity of it.

AII14 Influence of Sound Tempo on Work Performance and Comfort

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The purpose of this study is to examine the effect of the sound tempo on the work performance, EEG and subjective ratings of comfort under mental workload. Five levels of sound tempos (40, 80, 120, 160 and 200/min.) in 3 and 4 beat were applied. Four male and eight female students participated in the experiments. They were asked to perform one of three tasks with listening the sound. With sound tempo 120 and 80, the working rate were faster than that with others. The tempo 200 and the tempo 160 in 3 beat caused the higher mental stress. There was high correlation between comfort levels and α -wave. The tempo which makes condition comfort is not equal to the tempo which increase the working rate.