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| 学位論文題目 | Investigation into the relationship between human feeling and characteristics of wood by using subjective and objective evaluations (主観的客観的評価法を用いた木材感性評価に関する研究) |
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論 文 内 容 の 要 旨

The feeling of comfort when touching wooden products or staying in a house constructed from wood is a common experience. Japan is a leading forest country, however the wood self-sufficiency rate was quite low in Japan. In order to address this situation and promote to use wood, it is necessary to obtain the quantitative criterion that reveals the relationship between the human feeling and characteristics of wood. Therefore, comfortable feeling of wood was investigated by using the sensory tests as subjective evaluation in Chapter 2 and measurement of the hand movements as objective evaluation in Chapters 3 and 4.

In Chapter 2, I focused on the relationship between the human feeling and characteristics of wood with tactile perception, visual perception and visual-tactile perception by using sensory tests. The relationship among tactile impression, visual impression, visual-tactile impression and material properties was analyzed by using multiple regression analysis. The results showed that the visual-tactile impression was affected by both tactile and visual perception, however, the visual impression affected strongly than the tactile impression did. The terms related to material properties were significantly affected by tactile impressions. The emotional terms were significantly affected by visual impressions. The feeling which can be acquired from the tactile receptors; such as warmness, smoothness and moistness influenced strongly on the tactile impression.

In Chapter 3, in order to investigate the difference of hand movements that participants tended to use when assessing four material properties of wood; “cool-warm,” “hard-soft,” “rough-smooth” and “dry-moist,” the experimental equipment were applied a 3D real-time motion measurement system and a pressure distribution measurement system. The results showed that participants traced the square wood specimen with a rectangular motion to evaluate “cool-warm” and “hard-soft”. When assessing “cool-warm,” their hands stayed on one spot for a short period to check the transfer of heat, whereas when assessing “hard-soft,” their hands moved continuously to check the material hardness. When participants evaluated “rough-smooth” and “dry-moist,” they touched the surface of the wood continuously. When assessing “rough-smooth,” they used a slight rubbing movement between the surface of the wood and the skin, in contrast with the vertical hand movements used by participants to check moisture level when evaluating “dry-moist.”

In Chapter 4, the hand movements were examined and compared when evaluating two emotional terms; “uncomfortable-comfortable” and “dislike-like” and four fundamental terms of material properties when touching woods using the same methods of Chapter 3. The results showed

that hand movements when assessing emotional terms could be classified by hand movements when evaluating four fundamental terms. Many participants tended to assess “uncomfortable-comfortable” and “dislike-like” according to hand movements when assessing “rough-smooth” and “dry-moist”, and few participants assessed the emotional terms with “cool-warm” or “hard-soft” because these terms are related to visual information more closely.

In conclusion, the visual-tactile impression was influenced by not only visual impression but also tactile impression when assessing characteristics of wood. There was relationship between hand movements and the assessment for characteristics of wood. Now the result suggested that touching wood is a simple way, but it is an important behavior. In the future, it is our pleasure to realize and rediscover value of wood once again by touching “actual” natural wood.