

## Development of research and analysis methods for planning color restriction standards of streetscapes

近藤, 桂司  
九州大学大学院芸術工学研究府 デザインストラテジー専攻博士後期課程

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## 論 文 要 旨

区 分	甲	氏 名	近 藤 桂 司
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## 論 文 内 容 の 要 旨

The purpose of this study is to clarify similarities among color restriction standards of landscape districts and to establish research and analysis methods of grasping color features of landscapes: to promote development of diverse landscapes in the personality and characteristics of each urban streetscape.

This paper has 6 parts.

In chapter 1, I address that it is necessary to build a procedure for grasping features of colors of landscapes. Landscape administrative organizations implement measures to promote the development of good landscapes. Each Landscape Plan includes restrictions on colors of buildings without exception. The discretion of allowance, neither chaotic nor uniformly, is important for designing Landscape Plan.

In chapter 2, first, I clarify that comparison of restriction standards requires uniform expressions. Second, I clarify that it is important to examine conditions of photography based on “photographic analysis”. The originality of this research is to establish methods for transforming and analyzing of photographic images, and system for reporting analyses.

In chapter 3, I compare restriction of various landscapes districts. It is made clear that there is strong similarity in their upper limits of chroma. On exterior colors of buildings, comparatively high chroma colors are permitted to use in the hue range of 2.5R – 7.5Y. On roof colors, comparatively high chroma warm colors are also permitted. But there is strong tendency that cool colors are permitted only low chroma colors. I clarify that differences between restriction standards of historical environmental preservation districts are negligible.

In chapter 4, I explore two procedures for experimenting: measuring color values of landscape images by digital camera and grasping characteristics of the distribution of color values. Colorimetric calibration formulas are obtained from multiple regressions between camera *RGB* values of color tips and *L\*a\*b\** values that are measured the same color tips by a colorimeter. Then, I clarify that there are two effective methods for grasping characteristics of the distribution of color values. One is that of k-means cluster analysis: using 30 clusters, the other

is important elements analysis. As the means for grasping two types of analysis, this research shows three-dimensional chart and cruciform of deviation.

In chapter 5, first, I examine and analyze color values of 5 streetviews and confirm that the procedures are appropriate. Second, I confirm the differences between color restriction standards and real colors of objects by examining the colors of walls and roofs using the visual colorimetry. Last, I compare and study the colors of objects and results of photographic experiment. Establishment of the procedures for converting data into object colors is indispensable for practice use of restriction standards in the future.

In chapter 6, I summarize what I mentioned, and state research topics and perspective in future.