

Postupak ocjene doktorskog rada

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NASLOV RADA na hrv. jeziku:	Utjecaj površinske strukture tiskovne podloge na pojavnost efekta kromatske asimilacije
NASLOV RADA na engl. jeziku:	Influence of surface structure of the printing substrate on the appearance of the chromatic assimilation effect

SAŽETAK:

Trendovi grafičkih komunikacija kontinuirano zahtijevaju nova dizajnerska rješenja koja uključuju elemente pravilnih geometrijskih struktura kao što su npr. sustavi paralelnih linija različitih obojenja. Dosadašnjim istraživanjima ustanovljeno je da takvi sustavi paralelnih linija temeljeni na dvije rešetke, neovisno o tome jesu li akromatski ili kromatski, izazivaju pojavnost niza pozadinskih, ali i adaptacijskih vizualnih efekata koji uzrokuju neželjene pomake percipiranog tona boje kod promatrača.

Istraživačke aktivnosti u sklopu ove disertacije usmjerene su na do sada neistražene karakteristike pozadinskog vizualnog efekta kromatske asimilacije na geometrijskom modelu tzv. Munker-White-ove rešetke na različitim strukturiranim tiskovnim podlogama.

Za promatranje pozadinskog efekta kromatske asimilacije konstruirana je Munker-Whiteova linijska rešetka unutar koje su lijevi i desni pravokutni elementi sa istim svjetlinama. Navedeni dizajn je korišten upravo kako bi se definirao utjecaj geometrijskog dizajna linijske rešetke koji se često koristi u grafičkim rješenjima u trenutku kada isti interpolira sa strukturom koja je također geometrijski pravilno raspoređena. Rešetka ima geometrijski istovjetne linije i razmake sa varijacijom promatrane boje (primarnog stimulusa) i pozadine koja tu boju okružuje (sekundarnog stimulusa) u osnovnim bojama koje se koriste kod grafičke reprodukcije. Za vizualno ocjenjivanje korišteno je simultano binokularno usuglašavanje.

Temeljem dobivenih rezultata pristupilo se izračunu srednjih vrijednosti koje opisuju i odgovaraju percepciji pojedine testne kartice (lijevo i desno) koju vidi i promatra CIE standardni promatrač. Odstupanje u percepciji uzrokovano manifestacijom psihofizičkog vizualnog efekta kromatske asimilacije prikazano je putem razlike u svjetlini ΔL_{00} , kromatičnosti ΔC_{00} , tonu ΔH_{00} te ukupnoj razlici boje ΔE_{00} .

Na osnovi rezultata istraživanja utvrđena je i definirana ovisnost pomaka pojavnosti stimulusa predefiniranih kombinacija parova primarnih boja aditivne i suptraktivne sinteze u varijacijama različitih rastertonskih vrijednosti na strukturiranim površinama tiskovnih podloga.

Ključne riječi:

Kromatska asimilacija, strukturirana tiskovna podloga, Munker White-ov efekt, pozadinski vizualni efekti

EXTENDED ABSTRACT:

Contemporary graphic communication continuously evolves, prompting a constant quest for innovative design solutions that incorporate geometric elements. Specifically, designers often employ parallel line systems characterized by a rich array of colorings. However, previous research has unearthed a critical issue – whether these parallel line systems are achromatic or chromatic in nature, they tend to induce a variety of background and adaptation visual effects. These effects, while intriguing from a perceptual standpoint, can often lead to unintended consequences in the way colors are perceived by observers.

This dissertation represents a pioneering effort to venture into the unexplored realm of the background visual effects of chromatic assimilation within the context of the geometric model known as the Munker-White grid. What makes this research particularly fascinating is its exploration of how these effects manifest when applied to different structured printing surfaces. The central objective here is to ascertain the intricate relationship between the displacement of stimulus occurrence and the structured paper surfaces' various raster tone values.

To facilitate this investigation, a meticulously crafted Munker-White linear grid served as the linchpin. Within this grid, left and right rectangular elements, each possessing identical luminances, were strategically positioned. This design was meticulously chosen to isolate and elucidate the impact of the geometric layout of the linear grid, a common fixture in contemporary graphic solutions. This influence comes into sharp focus when this geometric layout interacts with a structure that is similarly and evenly distributed.

The grid itself boasts geometrically identical lines and intervals. What truly sets it apart, however, is the deliberate variation in the observed color (the primary stimulus) and the background surrounding that color (the secondary stimulus). These variations, realized through the use of fundamental colors integral to graphic reproduction, provide the foundation for this research's exploration of chromatic assimilation. The visual assessments conducted employed simultaneous binocular alignment, ensuring precise observation and data collection.

As this research unfolded, it moved beyond mere observation and ventured into the realm of quantitative analysis. The calculation of mean values emerged as a pivotal aspect of this process, as it allowed for a more nuanced understanding of how the CIE standard observer perceived each test card (both left and right). The deviations in perception, attributed to the psychophysical visual effect of chromatic assimilation, were meticulously quantified. These

deviations were elucidated through differences in luminance (ΔL^*00), chromaticity (ΔC^*00), hue (ΔH^*00), and overall color difference (ΔE^*00).

In essence, the research findings have offered profound insights into the intricate interplay between geometric design elements and chromatic assimilation within the realm of contemporary graphic communication. The dissertation has contributed significantly to the body of knowledge in this field, shedding light on the dependencies that govern the shift in appearance of predefined combinations of primary color pairs derived from additive and subtractive synthesis, particularly in relation to variations in halftone values on structured surfaces of print media. Designers and researchers alike stand to benefit from these profound insights, which hold the potential to inform and elevate the practice of graphic design.

Key words:

Chromatic assimilation, structured print substrate, Munker White effect, background visual effects

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