



INTERVIEW | PETER HANSELAER AND FRÉDÉRIC LELOUP, KU LEUVEN

In September the Light&Lighting Laboratory of KU Leuven (located at Campus Rabot in Ghent) celebrated its 25th anniversary. An excellent moment to tap into the story behind the renowned facility and research group with its founder, professor Peter Hanselaer and current co-leader, professor Frédéric Leloup.

25 years of Light&Lighting Laboratory

Peter Hanselaer started the Light&Lighting Laboratory in 1997 during the societal transition from the conventional light bulb towards energy saving lamps and led lights. Hanselaer: "In the beginning our research was merely focused on energy reduction. With the rise of high quality Leds, this is not the main challenge any more. Currently, we focus much more on the quality of lighting. An interesting field since it comprises severe knowledge and understanding of metrology and of human perception. We deliver education, training for industry and conduct research within four themes: Indoor Lighting, Metrology, Optical Design and Appearance & Perception." This academic year Hanselaer accepted a management position at KU Leuven and will thereby leave the Light&Lighting Laboratory in the hands of among others: Frédéric Leloup.

HARD & SOFT METROLOGY

Leloup: "Within my research domain and as a co-leader for the lab, I will focus on expanding the state-of-the-art hard metrology facilities and soft metrology knowledge in the coming years. Hard metrology contains the measurement of physical quantities and the design of the requisite measurement methods and set-ups. Soft metrology means that we look into the effects of visual perception. The combination of the two enables us to do reliable predictions on the quality of, amongst others, a lighting device."

THE LIGHT-BULB EFFECT

Over the years, the Light&Lighting Laboratory has developed its field of attention towards the intersection of measurement and perception. Hanselaer: "It is



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By Michiel de Boer (MOESASJI)



interesting to see that the last decade there has risen an understanding that human visual perception is a main influencer for the evaluation of the quality of light. A typical example is the development of a new metric for glare. Regarding the perception of objects, we can refer to a new generation of gloss meters. A gloss meter measures the amount of light that is reflected by a surface in the specular (mirror) direction. However, the visual perception is dependent on several extra factors. If we ask someone to point out which object delivers more gloss in the same background, a black or white object, the majority will choose the black object due to the stronger contrast."

Leloup: "You can imagine that the background and external factors such as different lighting conditions (day, night, fog) can play an important role in lighting design for example for traffic lights, road lighting and more. To be able to make a good prediction of the visual impression we have to take into account the perceptual attributes."

Hanselaer: "True. Next to light intensity also color plays an important role in human perception. To counter the so-called 'light-bulb effect' a couple of years ago we developed the 'Memory Color Rendering Index'. Let me explain. Especially indoors, the light source influences our perception. However, we have a certain image of what - for example - a yellow banana should look like. It is a distinctive sort of yellow that our memory connects to the banana. An effective light source should provide an image that brings out the color of the banana as we expect it to be. Therefore, we ask a number of participants to score the color given to a banana with respect to its expectation. This results in a new index that can give input for measurement (set-ups) and design."

CAMERA-BASED MEASURING

Leloup: "We increasingly use camera-based measurements that enable better capturing of elements such as atmosphere and visual impression. Our hyper spectral camera collects information pixel per pixel offering deep insight in the characteristics of light on different levels. This however brings a lot of data to the researchers and generates interesting discussions on calibration, measurement set-up and analysis of the results. As you can see, our research themes are not silo's but often have an interesting interplay. We can combine high-level measuring technology with perception studies, contribute to the design of optical systems and provide education to KU Leuven students and industry professionals on everything that is required to do so. We keep on investing in our knowledge with the community of students, young and older professionals."

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