Title: Colour, machine learning and creativity

Speaker: Stephen Westland

Abstract:

We are going through a period of almost unparalleled technological change that is dominated by advances in machine learning. This talk will look at developments in machine learning and how they change the way we think about colour research. Research findings increasingly rely on very large amounts of data and machine learning helps us to derive valuable insights from the data. Recent research to use machine learning in two areas - colour meaning and colour forecasting - will be described with examples. Some thoughts on future developments will be presented including the question of whether creativity is unique to humans or might be possible using machine learning.

Biography:

Stephen Westland is Professor of Colour Science and Technology at the University of Leeds (UK), a position he has held since 2003. During his academic career, Westland has published over 275 refereed books, book chapters, journal papers and conference papers in areas of colour measurement, colour vision and colour design. He holds visiting professorships at University of East Anglia (UK), University of Texas (USA) and Huazhong University of Science and Technology (China).

He has made a notable contribution to the use of computational methods in various areas of colour application. He was first author of Computational Methods in Colour Science (Wiley) that was first published in 2004 with a second edition published in 2012. He was one of the first people to use artificial neural networks in colour science during the first AI era when he showed that multi-layer perceptrons could be used to map between colorant recipe data and spectral or colorimetric data. He has since continued to use machine learning to predict colour from recipe data for textile fibre blends using neural networks and to automatically extract key colours from images. He also applied computational methods for colorimetry in dentistry where he developed an optimised whiteness index for dentistry that has been widely used worldwide in clinical trials to develop whitening products. Recently he explored the relationship between whiteness and yellowness in dentistry and developed a yellowness index for use in dentistry.

Westland has also made a sustained contribution to colour education, particularly through his long involvement with the Society of Dyers and Colourists (SDC) since 1983 where he served for many years on the colour measurement committee and, more recently, chairs the Society's Examinations, Qualifications and Examinations Board. He also held the honour of being President of the Society of Dyers and Colourists in 2019/2020. At the universities of Derby and Leeds, he has supervised 66 PhD students (40 as first supervisor). He founded a new journal with the SDC entitled Colour: Design and Creativity which later became the Journal of the International Colour Association (JAIC) of which he continues to be chief academic editor. He is a member of the Colour Literacy Project (supported by ISCC and AIC) and publishes on issues of colour education. He is co-author of the textbook 100 Principles of Color in Art and Design which addresses many contemporary issues in colour theory.