

Titre de la thèse/Thesis title : Psycho-physical assessment of differences between color Gaussian distributions
Laboratoire d'accueil / Host Laboratory : ImViA
Spécialité du doctorat préparé/Speciality : Instrumentation et informatique
Mots-clefs / Keywords : measures, just noticeable difference, non-uniform aspect
<p>Descriptif détaillé de la thèse / Job description</p> <p>Considering the design and fabrication of new material surfaces having a natural or complex aspect (wood, granite, leather...), it is a challenge to visually reproduce the same color aspect. To avoid any confusion, we are interested in texture perceived by human, also known as non-uniform and homogeneous aspect [1]. The question of this project is: How can we measure the distance between two textures to improve the quality control?</p> <p>The first objective is to assess the Just Noticeable Difference for non-uniform patches starting from color Gaussian distributions. The second one is to create a distance linked to human perception of nonuniform aspect scaling.</p> <p>A state of the art of the actual research on Just Noticeable Difference can be seen [2-4]. The purposed timeline for the Ph.D thesis is as follow :</p> <ul style="list-style-type: none"> - Task 1 : Develop an experimental protocol to evaluate the JND between two non-uniform surfaces. Realize the psycho-visual experiment associated to the protocol. Analyze the data from experiments to determine a JND depending on the variations of the 3D Gaussian non-uniform surfaces. - Task 2 : Develop an experimental protocol to evaluate order and scale of human perception of non-uniform aspect. Realize the psychophysical experiment associated to the protocol created previously. - Task 3 : Link the psychophysical results with a distance function to predict human perception of 3D Gaussian non-uniform aspect.
<p>Références bibliographiques / Bibliography</p> <p>[1] H. Chatoux, N. Richard, and S. Farnand, "How well do human perceive non-uniform surface noise variation?," in CIE Midterm Meeting Vienna 2025, 2025.</p> <p>[2] M. Giesel, T. Hansen, and K. R. Gegenfurtner, "The discrimination of chromatic textures," Journal of Vision, 2009.</p> <p>[3] R. Huertas, M. Melgosa, and E. Hita, "Influence of random-dot textures on perception of suprathreshold color differences," Journal of the Optical Society of America A, 2006.</p> <p>[4] F. Devinck and K. Knoblauch, "Color appearance of spatial patterns compared by direct estimation and conjoint measurement," Journal of the Optical Society of America A, 2023.</p>
<p>Profil demandé / Applicant profile</p> <p>The ideal candidate has Master in physics, information theory, cognitive psychology or computer science, preferably with some majors in color science or/and psychophysics. Other profiles may be considered case by case.</p> <p>Preferred selection criteria:</p> <ul style="list-style-type: none"> - Knowledge in: Color and/or Psychophysics. - Knowledge in: Python, especially Psycho-py - Knowledge in: Experimental design, Design of Experiment -Excellent communication skills in written and oral English. <p>Personal characteristics:</p> <ul style="list-style-type: none"> -Enthusiasm for experimentation, instrumentation, teamwork, and capability of independent problem-

<p>solving.</p> <ul style="list-style-type: none"> -Ability to work individually and a high level of personal responsibility. -Ability to meet deadlines and produce work of a consistently high standard. -Eager to disseminate research results through publications and presentations at both academic and industrial international conferences.
<p>Funding: ANR NUID</p> <p>Applications before pour le 15/10/2025 Position start: January 2026</p>
<p>Direction de la thèse:/ Thesis Supervisor Jean-Baptiste Thomas Hermine Chatoux</p>
<p>Encadrement de la thèse : Technical supervisors</p>
<p>Applicants are invited to submit their application to: Hermine.Chatoux@u-bourgogne.fr</p> <p>Application must contain the following documents:</p> <ul style="list-style-type: none"> - CV - Cover letter - At least 1 reference letter

