GUIA DOCENTE DE LA ASIGNATURA

Applied Advanced Colorimetry

Curso 2016-2017

(Fecha última actualización: 11/07/16)

MÓDULO	MATERIA	CURSO	SEMESTRE	CRÉDITOS	TIPO
	Applied Advanced Colorimetry		2º	5	Obligatorio

PROFESORES*	DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)
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	HORARIO DE TUTORÍAS*

MASTER EN EL QUE SE IMPARTE	
Máster E+ Color in Sciece and Industry COSI	

PRERREQUISITOS Y/O RECOMENDACIONES (si procede)

Module “Applied Color Science” (1st semester)

BREVE DESCRIPCIÓN DE CONTENIDOS (SEGÚN MEMORIA DE VERIFICACIÓN DEL GRADO)

This course completes basic colorimetry principles acquired in color science. It covers topics as: color differences, industrial colorimetry, color appearance and color imaging technology. In the course are presented the state or the art in these topics, their historical evolution and present development discussing the last research works published about them. The teaching methods are lecture, laboratory sessions and homework exercises. Additional seminars will be organized to introduce specific topics or applications to enlarge the covering of colorimetry. Practical and analytical skills are developed through homework exercises and laboratory sessions related with practical and industrial cases. For practical works students use MATLAB and specific software, as well as different measurement systems and equipment.

COMPETENCIAS GENERALES Y ESPECÍFICAS

OBJETIVOS (EXPRESADOS COMO RESULTADOS ESPERABLES DE LA ENSEÑANZA)

* Consulte posible actualización en Acceso Identificado > Aplicaciones > Ordenación Docente.

On completion of this course the students will be able to:

- Describe the color difference models.
- Describe the perceptual attributes of colour and the different systems for the representation of colour
- Demonstrate the use of colour measurement instruments and the interpretation of colour measurement data
- Demonstrate the computation of uniform colour space coordinates from reflectance measurements
- Describe the requirements for consistent colour reproduction across different media.
- Practical implementation of measurements of the appearance.
- Skills on methods of evaluation of the quality of color images.
- Basic methods of color reproduction on the industry.

TEMARIO DETALLADO DE LA ASIGNATURA

Topics to be taught (may be modified):

- Weighted color difference equations. Color tolerance experiments. CIE94 and CIEDE2000 color-difference formulas.
- Effects of viewing conditions. Achromatic adaptation models. The structure of chromatic adaptation (CAT) models.
- The appearance attributes of colored materials viewed against a neutral grey background. The appearance attributes of colored areas within images. The influence of surrounding and background color on the appearance of a central color element.
- The structure of color appearance models: CIECAM97's, CIECAM02. CAM implementation. CAM testing.
- S-CIELAB color-difference formulae. Image appearance models: iCAM
- Visual appearance(color + gloss, translucency and texture)
- Visual color matching. Instrumental color matching. Image color matching. Introduction to psychophysical methods of assessing of the perceived quality of images.
- Management of the transfer of color information between image capture devices and image production devices. Device characterization, Gamut mapping algorithms, Device calibration. Concepts of device dependent and device independent methods of color specification.
- Image quality Measurements. Rendering HDR Images
- Whiteness Measurements. Industrial Colorimetry.

BIBLIOGRAFÍA

Reference book:

- "Color Appearance Models", Second Edition. M.D. Fairchild. Wiley-IS&T Series in Imaging Science and Technology, Chichester, UK (2005).
- "Colour Imaging Vision and Technology". L.W. MacDonald, M.R. Luo. John Wiley & Sons, West Sussex, (1999).
- "Color Gamut Mapping". J. Morovic. John Wiley & Sons, West Sussex, (2008).
- "Computational Colour Science". S. Westland, C. Ripamonti. John Wiley & Sons, West

Sussex, (2004).

- "Colour Image Science". L.W. MacDonald, M.R. Luo. John Wiley & Sons, West Sussex, (2002).
- "Principles of Color Technology", 3rd ed. R. S. Berns, Billmeyer and Saltzman. John Wiley & Sons, New York, (2000).
- "Colorimetry. Understanding the CIE Sytem". K. Witt. "CIE Color Difference Metrics" (Chapter 4). Ed: J. Schanda, Wiley-Interscience 2007.
- Tutorials, lectures and notes provided by the course instructor.

Additional books:

- "Colorimetry. Fundamentals and Applications". N. Ohta and A.R. Robertson. Wiley (2005).
- "Digital Color Management: Encoding Solutions". E.J. Giogianni, T.E. Madden. Addison Wesley (1992).
- "Colour Engineering, Achieving device independent colour". P. Green & L. MacDonald. John Wiley & Sons Ltd, (2002).
- "The Reproduction of Colour". R.W.G. Hunt. Foutain Press, (1995).
- "Colour Physics for Industry". R. McDonald. Society of Dyers & Colourists, (1997).
- "The Science of Color", second edition. S.K. Shevell. Elsevier, (2003).

ENLACES RECOMENDADOS

METODOLOGÍA DOCENTE

Teaching methods: Lectures and lab classes, and homework exercises.

EVALUACIÓN (INSTRUMENTOS DE EVALUACIÓN, CRITERIOS DE EVALUACIÓN Y PORCENTAJE SOBRE LA CALIFICACIÓN FINAL, ETC.)

written exams (30%), homework/lab reports (50%), seminar (20%).

INFORMACIÓN ADICIONAL