



Education and Culture DG

ERASMUS MUNDUS



EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April 1st, 2016 – September 30th, 2016

Laboratory: Davalor Research Center – Universitat Politècnica de Catalunya
City, Country: Terrassa, Spain.

Title of the master thesis: Clinical validation of a fast binocular subjective refraction algorithm.

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Summary of the subject (maximum 1 page):

According to the most recent estimates from the World Health Organization (WHO), the uncorrected refractive error is the main cause of visual impairment, affecting 43% of the global population. Since the measurement of the refractive error is the most common test performed by optometrists and ophthalmologists, any improvement in the methodology and instrumentation is likely to have a great impact on the general population.

Refraction can be obtained both objectively and subjectively. Objective refraction measurements can be currently determined fast and easily with autorefractors and wavefront aberrometers and they are often used as a starting point for conventional subjective refraction. Several studies have reported that most modern objective refractometers are reliable and accurate with regard to subjective refraction. However, prescribing from objective findings alone achieves limited patient satisfaction and visual acuity does not improve sufficiently. In fact, the lack of data regarding the patient's psychophysical response is considered one of the main factors limiting spectacle prescription based on objective measurements.

Subjective refraction is considered the gold standard of refraction. It is based on comparing different dioptric lenses and measuring changes in vision to arrive at the dioptric lens combination that results in maximum visual acuity. In contrast to objective refraction, subjective refraction relies on the response of the patient and on the examiner's skills, with the consequent increased variability in outcomes.

There are very precise objective refraction systems, though not fully equivalent to subjective classical refraction. On the other hand, subjective classical refraction is not as reproducible as objective techniques. It is therefore reasonable to infer that a good refractive system should mix both methodologies.

The purpose of this Master Thesis is to investigate a new method to perform a fast non-cycloplegic refraction that includes the patient's psychophysical response without the need for clinician support.

Keywords: subjective refraction, visual psychophysics.

Additional information:

* Required skills: Optometric skills are essential. Self-motivated, objective-driven and capable of autonomous working within a multidisciplinary team is also important. Additionally, basic concepts in Visual Optics, Statistics, SPSS, R will be very helpful, although are not essential.

* Miscellaneous: This thesis contents will be considered confidential due to its closeness to market. Multidisciplinary environment with optics and optometry workshops comprising specialists and technicians in visual optics, optometry, optical design, metrology and color science. Possibility of joining the centre for a PhD/Research career in case of common interest. Early incorporation is welcome.