# Foreword

*When asked what psychophysics is, the answer can be difficult.*

*Romantically, psychophysics can be defined as the science aimed at measuring the soul.*

*Namely the sensitive soul, according to which the ancient scholastic philosophers argued many centuries ago.*

*Maybe it can sound overly romantic, but, probably, this is the most truthful definition: the goal of psychophysics is to quantify sensations, that is to say, the sensitivity of a sensory system: its capability of perceiving what it is in charge of. If physics measures actions, like the weight of a stone on a scale, psychophysics measures sense-a(c)tions, like the sensation of brightness of a spot of light: in this case, the scale is a sensory system: the visual system.*

*The challenge of such intention relies on the variability, on the volatility of the sensations. Rather than being fixed values, like the constant altitude of an airplane flying straight across the sky, sensations are fluctuating quantities, like the twirling of a butterfly over a flowery meadow: for these reasons, the exact (objective) measure of a (subjective) sensation is difficult per se.*

*To complicate things, unpredictable environmental or subjective variables can affect the flight of the butterfly. All these factors make hard to label the perceived strength of a sensation by assigning it a number, a quantity. And yet, psychophysics is crucial in sensory research and in the ophthalmological and audiological practice.*

*Here is a treatise written by an ophthalmologist and addressed to other ophthalmologists, vision specialists, researchers, curious ordinary readers as well as health professionals who deal with psychophysical examinations, but have no specific competence on this discipline.*

*I apologize in case careful reading will reveal some imperfections, especially in the mathematical equations and in the sections dealing with probabilistic computation. If it were the case, I am ready to make due corrections. For the consistent bulk of*

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*research on the topic, the sampling of references is unavoidably arbitrary, and I apologize in advance if many excellent papers may be missing.*

*As this is a manual aimed to explain in the simplest way a difficult matter to a non-specialized audience, math is kept to a minimum. At the risk of sounding naïve in many passages, nothing is taken for granted and even basic concepts are explained as simply and clearly as possible. Notions are often repeated for sake of clarity. The book is rich in footnotes: this is on purpose, as it can be read at a double level: the basic concepts are exposed in the main text, with additional information and more specific explanations in the footnotes, available to those who are interested in more detailed information.*

*Introducing as simple as possible the principles of psychophysics: this is the intent.*

*Making psychophysics a fascinating subject: this is the challenge and our deepest desire.*

*Carlo Aleci*