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# Preface

## A Book about Illusions and about Programming

Hello. If you find visual illusions fascinating this book is for you. I start by providing some background, some history and some theories about visual illusions, and I discuss in some detail twelve of my favourite illusions. Some are about surfaces, some are about apparent size of objects, some are about colour and some involve movement. But this is only one of the aims of the book. The other aim is to show you how you can create these effects on any computer.

The book includes a very brief introduction to a powerful programming language called **Python**<sup>®</sup>. No previous experience with programming is necessary. I will start from the basic concepts. I will also introduce a package called **PsychoPy** that makes it very easy to draw images on a computer screen. It is OK if you have never heard the names Python or PsychoPy before. I have chosen them because they are a great combination. Python is a modern and easy-to-read language, and PsychoPy takes care of all the graphical aspects of drawing on a screen and also interacting with a computer. By the way, both Python and PsychoPy are absolutely free, so you will not need to spend any money.

The structure of the book is simple. In Chapter 1 I discuss visual illusions, why they are more than just a curiosity, and how hard it is to classify them. I am an experimental psychology and in particular I study visual perception, therefore I have worked in this field for many years. In this chapter, however, I will not write an academic essay on illusions. Instead I will give a general introduction to the topic. Illusions are fun, and most people find them interesting and entertaining, I am sure that you will like them.

I have included many references in the text. The first example in Chapter 1 is “(Shepard 1990)”. Each time that you will see a name and a year like this, the reference is in the Bibliography at the back of the book. They are not strictly necessary as you read the book. They are important for two reasons, one is that it is only fair to give credit to the people who wrote the original articles, and the other is because some readers may want to explore in more depth some illusions or some claims.

In Chapter 2 I talk about programming, and in particular about a language called Python. I have used Python as a tool extensively but I am not a professional programmer. This book is not a standard programming manual, it is a quick guide and it provides enough information to start using the language. It is a bit like one of those phrase books for when you go to a foreign country and you want to be able to say “I would like an ice cream please”, and “let’s go to the beach!”.

Chapter 3 explains how to use PsychoPy to open a window, to set up the coordinates of a space in which to draw, and to show on the screen lines, rectangles and other shapes. We will use objects like windows, shapes, clocks and more. We will see how to create these objects and what properties they have. This approach is very powerful if you want to control the images on the screen, make them change in various ways, and it also allows the user to interact with the program for instance using the mouse.

Chapter 4 describes a program that draws a so-called **Kanizsa square**. This will be our first illusion. After that we will see several more. Many key references for these illusions are provided in a list of references at the back (if you would like to read more and delve into the science).

When I started on this project I was not sure whether I was going to teach programming with the excuse of looking at some visual illusions, or whether I was going to teach about visual illusions with the excuse of learning to program. I am still not sure.

The book has **figures** to illustrate both the illusions and some of the programming techniques, and **boxes** with information on specific topics. In addition, there are **messages** from twelve international scholars working on visual illusions in general, or on one in particular. They will introduce themselves and their work in a few sentences. I have included this feature so that you as the reader can meet some of the authors of the research that is discussed. They are from Belgium, England, France, Italy, Japan, Scotland and the USA.

There is, as you may have expected, a companion website to this book. The address has exactly the same name as the book:

*[www.programmingvisualillusionsforeveryone.online](http://www.programmingvisualillusionsforeveryone.online)*

Enjoy!

*Marco Bertamini*  
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