
Chapter 3

Introduction to Processing

Essential reading

Reas, C. and B. Fry *Processing: A Programming Handbook for Visual Designers and Artists* (MIT Press, Sep. 2007) [ISBN 0262182629].

Additional reading

Moggridge, B. *Designing Interactions* (MIT Press, 2006) [ISBN 0262134748]. Chapter 1–The Mouse and the Desktop, Chapter 2–My PC.

Packer, R. and K. Jordan (eds) *Multimedia: From Wagner to Virtual Reality* (W. W. Norton and Company, expanded edition 2002) [ISBN 0393323757]. Chapter 13–Alan Kay, User Interface: A Personal View.

The year 1984 saw the beginning of a major change in the creative industries which was heralded by the arrival of personal computers with graphical user interfaces (GUIs). The Apple Macintosh was the first widely-available personal computer that could display image, sound, speech, music, video and text. This caught the attention of the design industry and very soon sophisticated audio-visual software packages became the main tools of creative professionals. Among these were Adobe's *Photoshop*, for editing and creating images, and Digidesign's *Sound Designer II* for editing audio and music. The **What-You-See-Is-What-You-Get** (WYSIWYG) interface paradigm offered direct manipulation of media objects simply by pointing and clicking.

All media became part of the everyday desktop computing environment and, as a result, computing became an everyday tool in the creative industries. As the capabilities of computers grew, so did the ease with which media could be manipulated. Multimedia computing became a reality in the late 1980s and early 1990s, followed rapidly by the Internet and World Wide Web.

3.1 Processing

We will develop our creative tools in a programming language called *Processing*. *Processing* is an open source programming language and environment for programming images, animation and sound. It is widely used by students, artists, designers, architects, researchers and hobbyists for learning, prototyping and production.

The *Processing* open source project was initiated by Casey Reas (UCLA

Design/Media Arts Department) and Ben Fry (School of Design, Carnegie Mellon University). It is an outgrowth of ideas started in the Aesthetics and Computation Group at the MIT Media Laboratory, and inspired by an earlier JAVA-based language called *Design By Numbers* by John Maeda, who is a world-renowned graphic designer, visual artist, computer scientist and Professor of Media Arts and Sciences at the MIT Media Laboratory.

Introduced in 2005, *Processing* is based on JAVA, and provides all the functionality that JAVA offers. It was created to teach fundamentals of computer programming within a visual context and to serve as a software sketchbook and professional production tool. However, it was designed to be far simpler to use than the standard JAVA distribution. *Processing* has a user-friendly integrated development environment (IDE) and it has many pre-defined methods for performing graphical and multimedia design tasks with very little user-written code.

As open source software, *Processing* is an ongoing project and is developed by artists and designers as an alternative to proprietary software tools in the same domain.

3.2 Installing *Processing*

Learning activity

Method 1. CD/DVD-ROM

If you have the *Creative Computing 1* CD/DVD-ROM that came with this subject guide, then you can copy the *Processing* ZIP file from the Software directory.

Method 2. World Wide Web

Using a World Wide Web (WWW) browser, navigate to the www.processing.org web site. Click on the link to download *Processing*. This will save the *Processing* installation ZIP file to your computer.

Once the ZIP file is downloaded:

Move the *Processing* installation file to a folder that you want to install *Processing* to. For example, on a **Windows**-based machine you might try making a directory C://Program Files/Processing. Double click on the downloaded file and extract the contents to the new directory.

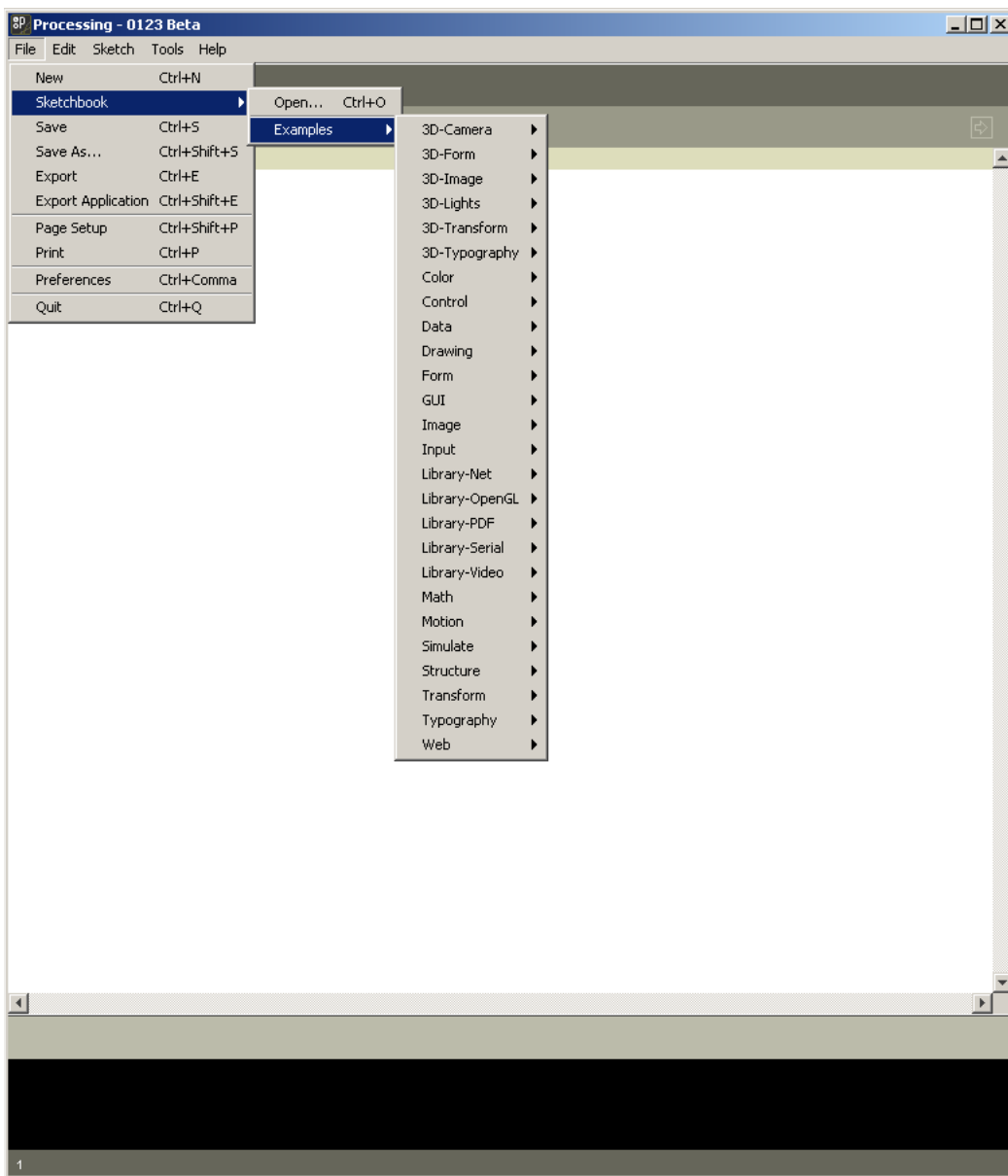
You should now make a shortcut by right-clicking on the processing.exe executable file and selecting the “make shortcut” menu item. Select the resulting “processing.exe shortcut” and move it to the desktop.

Now you can just go to the desktop and click the *Processing* icon and it will launch the application.

3.3 A Quick Tour of *Processing*

In Computer Science, a *program* is the list of instructions that is written by a human for a computer to execute. In *Processing* this list of instructions is called a *sketch*. This is to emphasize that this programming language is designed for creative computing.

To see what this means, click on the `processing.exe` shortcut that you made in the activity above. Once *Processing* is running click on the File menu and select Sketchbook→Examples; see Example 3.1.



Example 3.1: Opening example sketches in *Processing*.

Try opening one of the examples, such as `Form→ShapePrimitives`, and click on the *Run* button (which looks like a conventional video or audio Play button) at the top of the *Processing* sketch. There are many example sketches for you to try; see the exercises at the end of this chapter.

3.4 Summary and learning outcomes

This chapter has been primarily about introducing you to *Processing*, and describing how to download, install and use it.

You should now be able to:

- explain what *Processing* is and who wrote it
 - download *Processing*, install and run it
 - open and run the example sketches that are bundled with *Processing*.
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3.5 Exercises

Open each of the five sketches listed below, and run them by pressing the *Run* button at the top of the *Processing* application.

Try to understand how they work by looking at the code for each sketch in the text area. You should recognise some of the commands from Java, but you will also notice that *Processing* simplifies standard Java syntax.

Write a brief explanation (2 to 3 sentences) of what each sketch does.

- I) `Form→ShapePrimitives`
- II) `Structure→WidthHeight`
- III) `Drawing→ContinuousLines`
- IV) `Drawing→Pattern`
- V) `Input→Click`