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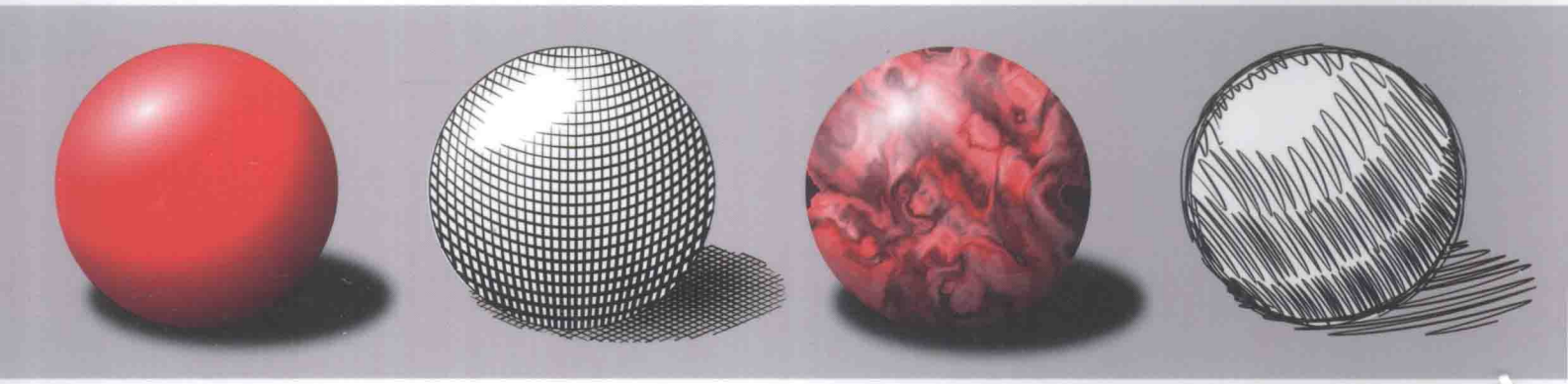
Inkscape

Guide to a Vector Drawing Program

Third Edition



Tavmjong Bah

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Inkscape

Guide to a Vector Drawing Program

Third Edition

Tavmjong Bah

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About the Author

Tavmjong Bah is a reformed physicist. He has worked on four continents as a teacher and researcher. Writing about Inkscape combines his love for technology and culture. He has been an active participant in the Inkscape community for several years. He's a registered Inkscape developer and has quite a few patches to his credit. His *nom-de-plume* is the title granted to him by the paramount chief of the Nso, a Cameroonian people. He lives in Paris.

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Overview of What Is in This Book

Inkscape, Guide to a Vector Drawing Program is ***the guide*** to the Inkscape program. The shorter, web-based, version is linked directly under the program's Help menu. This book is both an introduction and reference for the Inkscape drawing program. With Inkscape, one can produce a wide variety of art, from photo-realistic drawings to organizational charts. Inkscape uses *SVG*, a powerful vector-based drawing language and W3C web standard, as its native format. *SVG* drawings can be directly viewed by web browsers such as Firefox and Opera. A subset of *SVG* has been adopted by the mobile phone market. Inkscape is available free for Windows, Macintosh, Linux, and Solaris operating systems. The first third of the book is devoted to eleven tutorials that progress in difficulty from very basic to very complex. The remainder of the book covers each facet of Inkscape in detail. Updated for Inkscape v0.47, the book includes complete coverage of new features including: updated Pen and Pencil tools with new spiro, polyline, and sketch modes; new Eraser tool; and the new Snap toolbar with improved snapping. Advance topics covered include the use of Inkscape's powerful tiling tool, built-in bitmap tracing, and *SVG* use on the Web. The book includes plenty of tips (and warnings) about the use of Inkscape and *SVG*.

Introduction

This book serves as both a textbook and a reference for using Inkscape to produce high-quality drawings. It includes a series of tutorials followed by chapters that cover completely each facet of the Inkscape program. The book is full of tips and notes to enable the user to make the best use of the program.

Inkscape is an open source, *SVG*-based[1] vector drawing program. It is useful for drawing:

- Illustrations for the Web
- Graphics for mobile phones
- Simple line drawings
- Cartoons
- Complex works of art
- Figures for articles and books
- Organization charts

The file format that Inkscape uses is compact and quickly transmittable over the Internet. Yet it is powerful and can describe complex drawings that are scalable to any size. Support for the format has been added to web browsers and is already included in many mobile phones.

Inkscape supports the drawing of regular shapes (rectangles, circles, etc.), arbitrary paths, and text. These *objects* can be given a wide variety of attributes such as color, gradient or patterned fills, alpha blending, and markers. Objects can be transformed, cloned, and grouped. Hyperlinks can be added for use in web browsers. The Inkscape program aims to be fully *XML*, *SVG*, and *CSS* compliant.

Inkscape is available prepackaged for the Windows Macintosh, and Linux operating systems. The program and its source code are freely available. They can be obtained from the Inkscape website [http://www.inkscape.org/].

Inkscape is undergoing very rapid development with new features being added and compliance to the *SVG* standard being constantly improved. This manual documents Versions 0.46 and 0.47.

How to Use This Book

Following this introduction, there is a set of tutorials. The tutorials are designed to cover the basics of all the important features found in Inkscape and to lead the reader from the beginning to end of the drawing process.

The bulk of the book is devoted to a detailed discussion of all of Inkscape's features including examples of solving common drawing problems. Both the strengths and weaknesses of Inkscape are pointed out.

Depending on one's background, one may use the book as a reference or read the book from front to back. In general, the more fundamental topics are covered first. Novices are encouraged to work through each of the tutorials sitting in front of their computer. At the end of the book are a few drawing challenges.

Conventions:

- *Click*: Click on icon, object, and so forth with the **Left Mouse** button (unless another mouse button is indicated) with immediate release.

[1] All acronyms are defined in the Glossary.

- *Click-drag*: Click on icon, object, and so forth with the **Left Mouse** button (unless another mouse button is indicated) and hold the button down while moving the mouse.
- Select the option in the pull-down menu. Example: File → Document Properties... (**Shift+Ctrl+D**): Select "Document Preferences..." under the "File" pull-down menu. **Shift+Ctrl+D** is the keyboard shortcut corresponding to this option.

One-button Mice

Users of one-button mice might want to upgrade to a multi-button mouse. Inkscape makes good use of a three-button mouse with a scroll wheel. (Inkscape also makes good use of graphics tablets.) In the mean time, the button on a one-button mouse corresponds to the **Left Mouse** button.

Icons

The icons used in this book are in general those provided by Inkscape's default icon theme. Some icons, however, are provided by the operating system. It is possible that the icons you see in your version of Inkscape are different depending upon the source of your version. Regardless of what icons are used, the functionality remains the same.

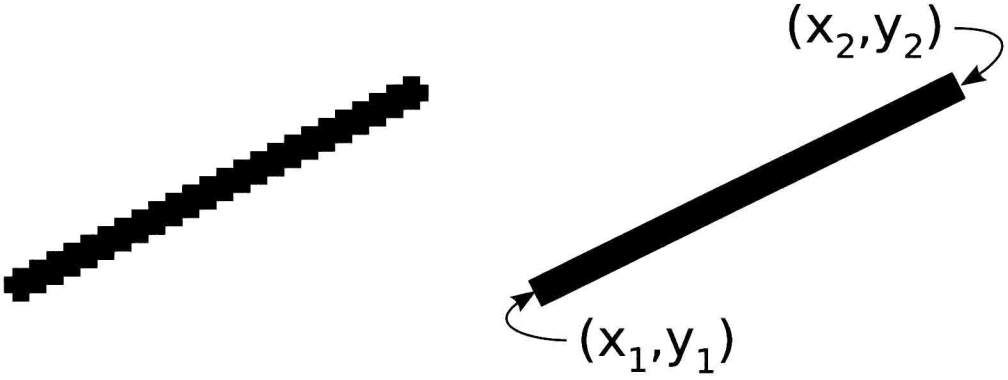
Book Website and Color Addendum

The book has a website [http://tavmjong.free.fr/INKSCAPE/] with some *SVG* examples and tests as well as graphics for use with the tutorials.

Being a drawing program, color is very important in Inkscape. You can download from the website a color addendum, which has many of the book's figures in color. Figures in the book that have a color version in the addendum are marked with the symbol ✪.

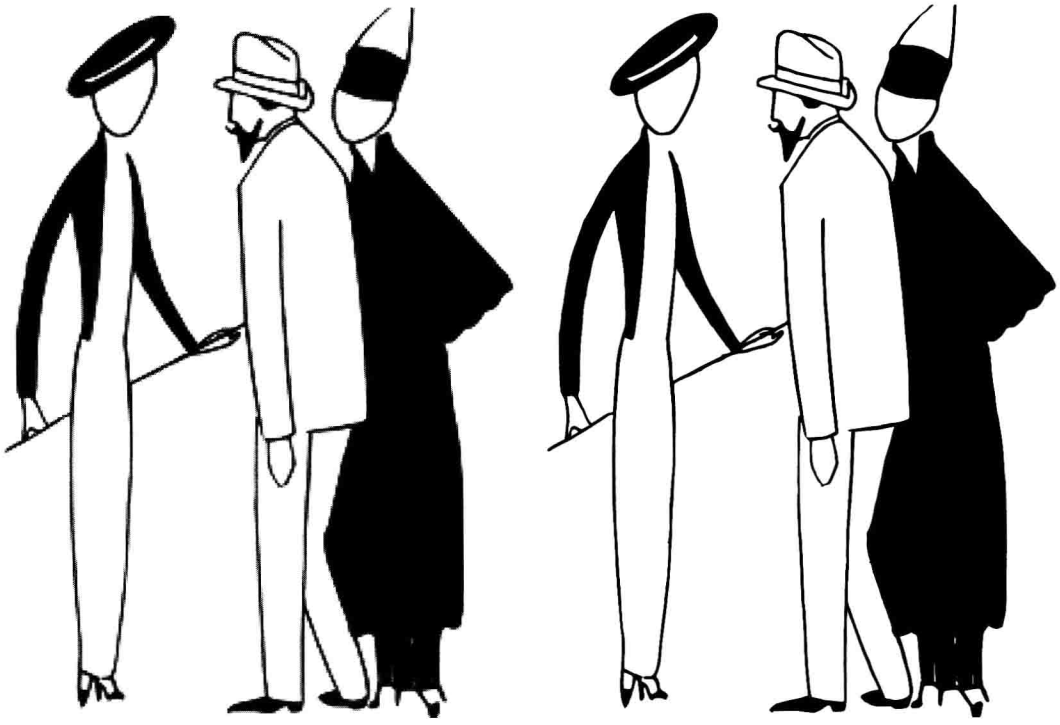
Vector Graphics

There are two basic types of graphic images: *bitmap* (or *raster*) images and *vector* images. In the first case, the image is defined in terms of rows and columns of individual pixels, each with its own color. In the second case, the image is defined in terms of lines, both straight and curved. A single straight line is described in terms of its two end points. The difference in these types of graphic images becomes readily apparent when a drawing is enlarged.



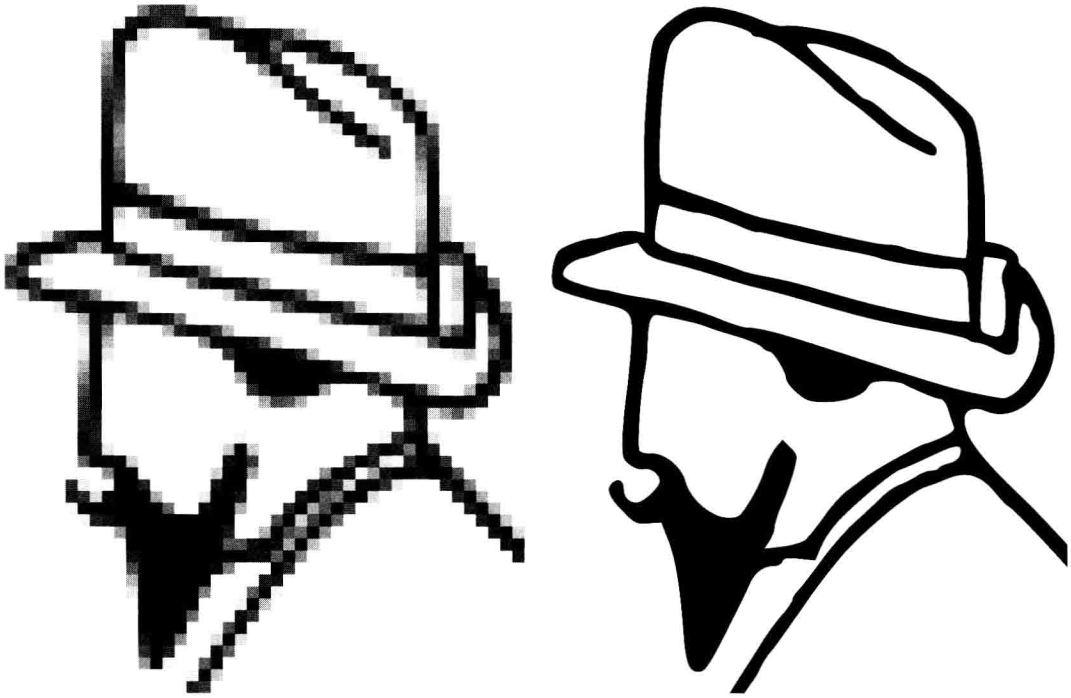
The same line is shown on the left and right. On the left it is displayed as a bitmap image, while on the right it is displayed as a vector. In both cases, the line has been scaled up by a factor of four from its nominal size.

When the bitmap resolution of a drawing matches the display resolution, the objects in the drawing look smooth.



The same drawing, but defined as a bitmap image on the left and a vector image on the right. If the output device has the same resolution as the bitmap image, there is little difference between the appearance of the two images.

If the bitmap resolution is significantly less than the display resolution, the display will show jagged lines.



The head of the gentleman in the above drawings has been scaled up by a factor of five. Now one can see a difference in the quality of the bitmap drawing (left) and the vector drawing (right). Note that the bitmap image uses *anti-aliasing*, a method of using grayscale to attempt to smooth the drawing.

All output devices, with few exceptions, use a raster or bitmap image to display graphics.[2] The real difference between drawing with bitmap graphics and vector graphics is the point at which the image is converted into a bitmap. In the case of vector graphics, this conversion is done at the very last step before display, ensuring that the final image matches exactly the resolution of the output device.

SVG

SVG stands for *Scalable Vector Graphics*. *Scalable* refers to the notion that a drawing can be scaled to an arbitrary size without losing detail.

Scalable also refers to the idea that a drawing can be composed of an unlimited number of smaller parts, parts that can be reused many times.

The *SVG* standard is directed toward a complete description of two-dimensional graphics including animation in an *XML* (eXtensible Markup Language) format. *XML* is an open standard for describing a document in a way that can be easily extended and is resistant to future changes in the document specification. A drawing saved in one version of *SVG* by one version of a drawing program should be viewable, to the full extent possible, by any previous or future version of any drawing program that adheres to the *SVG* standard. If a program doesn't support something in the *SVG* standard, it should just skip over any part of a drawing that uses it, rendering the rest correctly.

SVG files are small, and drawings described by the standard adapt well to different presentation methods. This has led to great interest in the standard. Support is included in many web browsers (Firefox, Chrome, Opera, and Safari), or is available through plug-ins (e.g., Adobe [http://www.adobe.com/svg/viewer/install/], RENESIS [http://www.examotion.com/], Ssrc SVG [http://www.savarese.com/software/svgplugin/], and soon Google [http://code.google.com/p/sgweb/]). Over a dozen companies including Apple (iPhone), Blackberry, LG, Motorola, Nokia, Samsung, and Sony Ericsson produce mobile phones that utilize a subset of the full *SVG* standard that has been tailored for devices with limited resources.

The Inkscape Program

Inkscape has its roots in the program Gill (GNOME Illustrator application) created by Raph Levian [http://www.levien.com/] of Ghostscript fame. This project was expanded on by the Sodipodi [http://sourceforge.net/projects/sodipodi] program. A different set of goals led to the split-off of the current Inkscape development effort.

The goal of the writers of Inkscape is to produce a program that can take full advantage of the *SVG* standard. This is not a small task. A link to the road map for future development can be found on the Inkscape website [http://www.inkscape.org/]. Of course, you are welcome to contribute!

Instructions on installing Inkscape can be found on the Inkscape website. Full functionality of Inkscape requires additional *helper* programs to be installed, especially for *importing* and *exporting* files in different graphic formats. Check the log file `extensions-errors.log` located on Linux at `~/.inkscape/` (v0.46) or `~/.config/inkscape/` (v0.47) and on Windows at `%userprofile%\Application Data\Inkscape\` for missing programs.

Help

The first place to look for help is under the *Help* menu. Here you will find links to: this book (!), a web page (as of v0.46) containing all the *Keyboard* and *Mouse* commands (Help → Keys and Mouse Reference), tutorials, and a FAQ. Some of the items require a web browser and that you be connected to the Internet.

[2] The few vector output devices include large plotters for engineering and architectural drawings and archaic Tektronix terminals.

If you encounter a problem that is not covered by this book or the other resources under the *Help* menu, here are some other places to look:

- Inkscape website [http://www.inkscape.org/]. A variety of information is available, but it is not always well organized.
- Inkscape FAQ [http://wiki.inkscape.org/wiki/index.php/FAQ]. A good place to look for answers to common questions.
- Official Mailing Lists [http://www.inkscape.org/mailing_lists.php]. Inkscape has a friendly *Users* list. Lists also exist in a variety of languages including Italian, Spanish, French, and Portuguese.
- The "unofficial" Inkscape Forums [http://www.inkscapeforum.com/].

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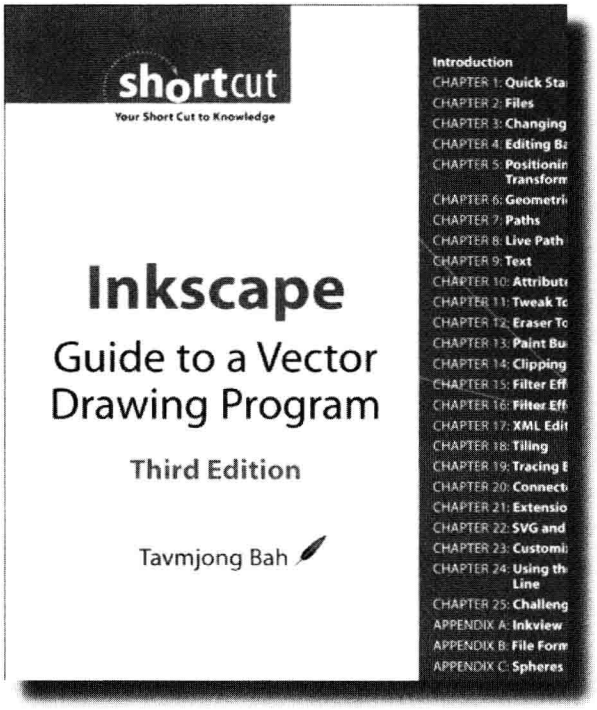

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