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JAG II

This software, from Ray Dream Corporation, removes *jaggies* (jagged edges sometimes found in computer images) from an image by automatically anti-aliasing the edges or by increasing the resolution. It is simple and efficient, but balks at very large files.

The ToolBox

Two selection tools: Hand Mover and Zoom.

Selection Menu and Tools

Freehand and Rectangle.

File Save/Load Conventions

You can load **PICT**, **TIFF**, **Photoshop 2** and **2.5**, **MacPaint**, **QuickTime Movie**, **Movie**, and **PICS** formats. Save formats include **PICT**, **TIFF**, **Photoshop 2** and **2.5**, and **EPS**.

Jaggy

See

Bitmapped Graphics

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Janov, Rob

See
Apple Logo

Japanese Games

See
Eastern Mind, Yellow Brick Road II

Jasik's Debugger

See
The Debugger

Java

Java is an **object-oriented programming** language developed by **Sun Microsystems**. It addresses issues of security and cross-platform compatibility that are of special concern in the environment of the **Internet**.

(The language Java is commonly confused with the **World Wide Web** browser HotJava—see **HotJava** for more information about the browser.)

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Although originally developed by Sun for programming various consumer electronic devices, such as VCRs, pagers, and TVs, Java is now being used to create programs for the **World Wide Web** . Because Java is byte-code compiled (see **Compiled Language**), programs written in Java are platform-neutral, making Java an ideal programming language for the World Wide Web, where a wide variety of platforms coexist. With a Java-compatible Web browser such as **Netscape Navigator** , a computer of any type can download a Java program (called an applet) from a **Web server** and run it.

It's important to note that, unlike **CGI** scripts, Java applets run on the client machine, not the server. This can lead to greater speed, flexibility, and interactivity on the World Wide Web; the possibilities are only just beginning to be explored. Traditionally, bandwidth and server load have limited the extent of Web-based applications. With Java, however, there is the potential to create Web-based word processors, spreadsheets, or graphics programs.

To view Java applets, all you need is a Java-compatible Web browser, such as Netscape Navigator, that automatically displays applets when the page is loaded (see the following figure). Just like other Web content, it doesn't matter whether the applet was developed on a Macintosh.

If you want to create your own Java applets, you'll need a few more tools and a lot more knowledge. First, you'll have to learn the language. Java is an object oriented language, similar to **C++** but a bit simpler. Here is a very simple Java program that displays the words "Hello World!":

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```
public class HelloWorld {  
    public static void main(String args[]) {  
        System.out.println("Hello World!");  
    }  
}
```

Books on the Java language have been flooding the stores, and Sun's Java Web site (<http://java.sun.com>) also has a great deal of information to help you learn the language.

Java is clearly similar to the C++ programming language, but differs in many important particulars:

- C++ is *machine dependent*, and C++ programmers may directly access to specific physical memory locations on the **host** machine. In contrast, Java runs on the "Java virtual machine"—Java applications cannot directly access specific memory locations on the host machine, but can run on any platform that supports the virtual machine architecture. (You might think of the software that runs 68K applications on a PowerPC Mac as a "virtual 68K" machine for the PowerPC platform.)
- The user of a Java application may limit the Java application's capabilities to perform security-sensitive tasks, such as reading and writing to the user's hard disk and establishing **network** connections. "Applets," the tiny Java applications commonly

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distributed over the Web, have very limited security privileges. As a result, it's (theoretically) impossible to write a virus, Trojan horse, or other malicious code in Applet format.

- C++ and other high-level programming languages are typically translated to platform-dependent machine code; that is, *compiled*, and run at once, whereas Java applets are compiled into “pseudo-code” that is *interpreted* by the virtual machine on a line-by-line basis.
- Java was written as a new language, and is not intended to be backwards-compatible with certain outdated features of the C language. (C++ is backwards-compatible with C.) Java implements support for features that most modern programmers find attractive, such as objects, multithreading, and automatic memory management.

Although Java is relatively easy to learn, it is by no means a beginner's language. If you choose to start your programming life with Java, be prepared to invest some time before you become proficient.

You'll also need a Java **compiler**. Several compilers are available for the Mac, including Sun's own Java Development Kit (JDK), Symantec's Caffeine compiler for the **Symantec C++ IDE**, Natural Intelligence's **Roaster IDE**, and Metrowerks' **CodeWarrior** tools.

Programming for the MacOS has always been difficult, and Java makes this process only slightly less challenging for seasoned Mac developers by replacing calls to the Mac Toolbox with calls to “methods” defined in Sun's

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Java Developer's Toolkit. Java does facilitate porting of Java applications from other platforms to the Mac.

The Java virtual machine can exist *inside* a Web browser like **Netscape Navigator** or Microsoft **Internet Explorer**, and applets are used to deliver interactive content to Web users. Typically, applets are smaller in size (and hence quicker to load) than other multimedia formats.

Java, Pros and Cons Many programming languages exist in the world, and some of them (PERL and Python) implement similar features. Java is a well-designed language, but most importantly, Java marks a triumph of timing and marketing: most major players in the world of software and hardware signed some sort of licensing contract with Sun in 1995. Two of the biggest advantages of Java are that it's cross-platform and everybody's using it.

Java, Availability Java is an open standard, and The Java Development Kit is freely distributed by Sun. Users can download it from Sun's Web site (<http://java.sun.com/>). Third-party developers are free to create tools to help developers create Java applications: Natural Intelligence has already released a development tool for the Macintosh called **Roaster**, and other developers can be expected to follow suit.

Java, Future Trends Java is still a work-in-progress, and it's likely that many new features will be introduced in the first few years of Java's development. Tentative plans already underway include "just-in-time" compilation, which will allow Java to run significantly faster, and encryption-based authentication of Java programs, to add even more

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security.

Java is intended to be the programming lingua franca of the Internet, and if this plan is realized, Java (or its successors) will be the language in which much of the software in the world is written. Ideally, programmers (and even users) will be able to combine Java objects from different Internet sources to quickly create new, customized software packages—it's approach similar to Apple's nascent OpenDoc and Microsoft's OLE technologies.

Even if you don't want to learn the Java language, you can use Java in your own Web pages by modifying existing applets. For example, you can use the "Tumbling Duke" applet with a different set of GIF images to create your own customized "Tumbling Widget" applet. There are many sample applets available from Sun and elsewhere that can be customized in this way.

Natural Intelligence (<http://www.natural.com>) has also set up a Macintosh Java **mailing list** . To subscribe, send an email message containing just the words "subscript java-mac" to majordomo@natural.com. Your email address is taken automatically from the header of your message.

See Also

Applets; C; C++; CodeWarrior; Host; HotJava; Internet; Internet Explorer; Netscape Navigator; Network; Object-Oriented Programming; Programming; Roaster; Sun Microsystems; Web Browser; World Wide Web

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JavaScript

A simple scripting language developed by **Netscape** Communications, Inc., that enables Web designers to embed simple executable code in their **Web pages**.

JavaScript is easier to use than Sun Microsystems' programming language **Java**, but also less powerful. JavaScript is useful for moving some simple processing tasks (for example, making sure that a form has been filled out correctly) to the **client**'s machine, thereby relieving the load on **server**-side **CGIs**, and for adding program-flow-control-like features to **HyperText Markup Language (HTML)**.

JavaScript is easy to use—if you already program in C++ or Java. If not, it's probably not an easy first language to learn, given the scanty resources.

In order to write software that actually works, it's important to have development tools—documentation, a debugger, and a programming-friendly text editor are pretty basic requirements. These tools have not yet been released for JavaScript.

Although JavaScript is an open standard, as of this writing it's only supported by the Netscape Navigator World Wide Web browser (and is built into the 2.0 release of Navigator).

See Also

Applet; CGI; Client; HotJava; HTML; Java; Netscape Navigator; Web Page,

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Designing; World Wide Web Browser

Jaz Drives

See

Zip Drives

Jigsaw Puzzle Application

This is a game in the **Apple menu** that takes any **PICT** image and transforms it into a jigsaw puzzle. The object of the game is to reconstruct the original image. There are a few options: When you start a new puzzle (by selecting Start New Puzzle from the Options menu) you can make the size of the jigsaw pieces Small, Medium or Large. (Larger pieces mean a much easier puzzle.) Once you make your selection, the puzzle takes the image and scrambles it into puzzle pieces for you to reconstruct.

If you correctly reconstruct the puzzle, you'll hear musical tune celebrating your feat. (You can turn off the sound in the **Options menu**.) If you're totally stumped, you can have the puzzle solve itself by choosing Solve Puzzle from the Options menu.

You can also set the background color of the window so it doesn't clash with your puzzle. The first time you open puzzle, it comes with a color map of the world, but you can copy and paste any **PICT** image directly into the puzzle and

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use that image as a puzzle.

To use the jigsaw puzzle, follow these steps:

1. Select jigsaw Puzzle from the Apple menu.
2. Choose Start New Puzzle from the Options menu.
3. Select what size puzzle pieces you want to use.
4. Reconstruct the image by dragging the individual pieces into place.

See Also

Apple Menu; Copy; Cut; Options Menu; Paste; PICT

Jigsaw Puzzle Graphic, Replacing

You can replace the graphic in the **Jigsaw Puzzle DA** in the Apple menu with any **PICT** image. To change the graphic, copy a **PICT** image to the **Clipboard**, open the Jigsaw puzzle, choose Paste from the Edit menu (⌘-V), and the new image replaces the existing puzzle image.

You also can copy any icon's image (by copying from the **Get Info** dialog box) into the jigsaw puzzle as well.

See Also

Clipboard; Jigsaw Puzzle DA; PICT

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Jobs, Steve

Steve Jobs is one of the founders of Apple Computer. He grew up in Los Altos, California, a stone's throw away from **Cupertino**. Jobs was a true son of Silicon Valley: his adopted parents worked as a payroll clerk at Varian and a machinist at Spectra Physics.

Steve Jobs met **Steve “Woz” Wozniak** when he was a sophomore at Homestead High School. The two met through a mutual friend, Bill Hernandez, who was a classmate of Jobs' and a neighbor of Wozniak. As a teenager, Jobs was a loner and an electronics enthusiast, like Woz. Jobs' phone call to William Hewlett of Hewlett-Packard about some parts got him a summer job at the electronics company.

Jobs attended Reed College in Portland, Oregon. While there, he embraced the counter-culture with open arms—he was on a search for enlightenment. He became a vegetarian and studied Richard Alpert's *Be Here Now*. Before long, Jobs dropped out of school.

Hoping to make a pilgrimage to India to become a follower of Alpert's guru, Jobs returned to Silicon Valley to earn some money. He managed to get a job at Atari, the video-game pioneer, where he was not well-liked and had a nasty habit of insulting the engineers. Jobs eventually managed to get his boss to send him to Germany on business. This was his ticket to India.

Steve Jobs spent several months in India, but left disillusioned. He returned to work at Atari as a technician. Between 1974 and 1976, Jobs returned

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frequently to Oregon, living for a time in a commune and undergoing primal scream therapy.

In 1975, Jobs began to attend meetings of the **Homebrew Computer Club** with Wozniak. When Woz built his own computer and showed it to the members of the club, Jobs had found his calling: the computer business.

Jobs convinced Wozniak to go into business selling Woz's new computer. They received an order for 50 of the new Apple Is from **The Byte Shop** , and Apple Computer was born. From the start, Jobs was driven to build Apple into something great.

While Woz focused on the technical side of the business, Jobs did everything he could to expand Apple. He convinced A.C. **"Mike" Markkula** , who had made his fortune at Fairchild and Intel, to invest in the newfound venture. Markkula managed to make the disheveled Jobs more presentable, and he helped make Jobs one of the new personal computer industry's visionary spokespeople.

In the late 70s, Jobs led the team that created Apple's first failure, the Apple III. A significant contribution to the Apple III's difficulties was Jobs himself. His specifications for the project changed almost daily. He also decided on the design of the case without regard to the parts that would have to fit inside it. When it was clear the Apple III was a failure, Jobs tried to distance himself from the fiasco by turning his sights to the **Lisa** project.

The Lisa project team was charged with designing the next generation

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computer to succeed the Apple II line. As the project progressed, Jobs' involvement became less and less welcome. His micro-management of every detail slowed the project down and annoyed the rest of the project team. In a 1980 reorganization, Jobs was removed from the Lisa project by Apple president **Mike Scott**. Scott was concerned that Jobs' combative style and sometimes capricious technical decisions would lead the Lisa down the same path the Apple III had taken.

Angry, but far from defeated, Jobs turned his sights to yet another project: the small Macintosh project headed by **Jef Raskin**. Jobs gradually took control of the Macintosh project, eventually prompting Raskin to leave in 1982. Under Jobs' combative, zealous, and visionary leadership, the Macintosh project gave birth to the Macintosh product we all know and love. In the midst of it all, Jobs managed to convince **John Sculley** to leave his position at Pepsi and come to Apple as CEO.

Following the Mac's flashy debut, Jobs assumed control of the merged Lisa and Macintosh projects. As he had done before, Jobs began to meddle in parts of the business over which he had no authority. In the difficult times Apple was facing, his exploits were becoming a liability.

In May 1985, Jobs discovered that Sculley planned to have him stripped of his responsibilities, and planned a coup of his own. When Sculley was in China on business, Jobs hoped to have him removed from his position. Sculley caught wind of the plan and promptly canceled his trip. At an emergency meeting, the executive staff unanimously backed Sculley. Jobs was removed

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from his operational role but retained the chairmanship.

Four months later, in September 1985, Jobs resigned from Apple and announced his plans to form a new company, NeXT, to cater to the educational computing market. His announcement that several key Apple employees would be joining him raised the ire of Apple's board. The dispute was later settled when Jobs agreed not to hire any additional Apple employees for a period of six months and not to compete directly with Apple.

After starting up NeXT, Jobs bought the computer division of George Lucas' LucasFilm, Ltd., Pixar. In addition to creating some breakthrough animation software, Pixar is the company responsible for Disney's computer-generated movie *Toy Story*. The hoopla surrounding *Toy Story* has put Jobs back in the spotlight.

Steve Jobs has remained a unique character in the computer industry. As John Sculley wrote in his book *Odyssey*, "He was arrogant, outrageous, intense, demanding—a perfectionist. He was also immature, fragile, sensitive, vulnerable. He was dynamic, visionary, charismatic, yet often stubborn, uncompromising, and downright impossible."

See Also

Byte Shop, The; Cupertino; Homebrew Computer Club; Markkula, Mike; NeXT; Raskin, Jef; Scott, Mike; Sculley, John; Wozniak, Steve

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Johnny Mnemonic

See

Hollywood Games Connection

Journeyman Project

See

Daedelus Encounter

Joysticks

Joysticks enhance the fun of playing action games or sitting in a cockpit of a flight simulator. Like a mouse or trackball, they move the cursor and let you select options by pressing buttons. Most joysticks are **Apple Desktop Bus** devices.

Many companies make joysticks and the more common game pad (as shown in the illustration). However, finding a good joystick is difficult. Ruggedness is a key factor for uninhibited game play, and buttons, ergonomics, and programmability are all important. Prime factors are ease of control and rapidity of firing. Highlights of some of the better, well-known joystick models follow.

- **MouseStick II.** MouseStick II by Advanced Gravis Computer

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Technology, uses optical sensing to provide smooth control with up to 1,200 lines of resolution. This joystick comes with customized control settings for many popular games; you can even create your own custom settings. MouseStick II has five independent user-definable buttons, plus a full-size padded handle with adjustable tension. It is a popular joystick for flight stimulation games.

- **Thunderstick-Mac.** Thunderstick by Microspeed, Inc., offers dual thumb buttons on the comfortable handle, and an x- and y-axis centering adjustment. This joystick makes aerial simulations and arcade games exciting. It has a street price of \$69.95
- **QueStick II.** QueStick II by MicroQue, uses a custom Motorola chip onboard to accommodate game-specific control sets. It has a special ADB address assigned by Apple to avoid conflicts with the mouse (which you can leave connected). With the QuePrefs Control Panel, you can assign specific functions to the controls (two buttons and a switch) for each game and player. Or you can select a QueSet from the library of game sets for many popular games. QueStick also provides keystroke emulation for games that work better with keystrokes than with firing buttons. The joystick handle is contoured to fit your hand comfortably, and trim pads allow you to center it precisely. The Power On LED changes color when you press any button. Cushioned feet prevent slipping and help to avoid marring tabletops. It has a street price of \$49.95.

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See Also

Apple Desktop Bus; Keyboards; Mice

JPEG

JPEG (Joint Photographic Experts Group) is a **QuickTime compressor** , as well as a compression algorithm available in some graphics programs, such as Adobe **Photoshop** . JPEG is very good at compressing photographic images to very small sizes, because it is a glossy compressor designed specifically to handle photographic images. When compressing an image, you can usually choose between a range of compression values; the higher the level of compression the smaller the resulting file, but the image starts to degrade. At high compression rates the image becomes blocky. You can see blocks of color in the image rather than fine details. At medium to low compression rates, however, the difference between the image and the original is only visible by examining the image at the pixel level, and the file size is still dramatically reduced.

There are other factors to consider before using this compression algorithm. Compressing an image can take several seconds (although the faster **Power Macintosh** computers are starting to make this much less of an issue). JPEG is not suited for compressing computer graphics. The images often have high contrast areas, and **compression artifacts** are very visible around these graphics.

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Although it's possible to compress a movie using the JPEG compressor, because this compression is not optimized for movies (it takes several seconds to compress a frame and doesn't use temporal compression), performance will be very poor.

Several video compression hardware boards use variations of JPEG routines to compress and decompress video. This is only possible because the hardware accelerates the compression algorithm. These movies play well only on those boards. **Compression** ratios range from 3:1 to 30:1.

Users can choose the compression ratio that will be used when saving images to JPEG format; image quality isn't usually noticeable unless ratios higher than 10:1 are chosen. JPEG graphics are common on the Internet.

See Also

Asymmetrical Compressors; Bitmapped Graphics; Compressor; Drop Frames; Spatial Compression; Symmetrical Compressors; Temporal Compression

JPEGView

A **helper application** by Aaron Giles that controls the display of JPEG format images.

JPEG is a popular format for images displayed on the **World Wide Web** . Although some **Web browser s** can display JPEG images inside the browser window, JPEGView lets the user control what color palette is used to display

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an image, the magnification of the image, and so on.

JPEGView is probably the best software for viewing JPEG images on the Mac platform. JPEGView has a very complete set of tools; the program is well documented, System 7.5 savvy, is AppleScript scriptable and recordable, and is “postcardware”—the price of the software is a postcard to Mr. Giles.

JPEGView can only display as many colors as your video hardware allows, but it enables you to optimize the display of images on 256-color monitors.

JPEG displays images according to the monitor settings of your Mac (see the following figure). If you have the video hardware and your Monitor control panel is set to thousands or millions of colors, JPEGView displays the image by matching each pixel in the monitor to a pixel in the JPEG file and by displaying the color specified. (However, unless your monitor and the scanner that scanned the image in the first place are perfectly calibrated—it records and displays the same color in exactly the same way—the monitor only approximates the specified color.)

You have two choices for getting an image into JPEGView: You can move the images by hand, or you can configure Netscape to launch JPEGView automatically.

To open images manually, follow these steps:

1. If you are using Netscape Navigator, click and hold down the image you want to open until the pop-up menu comes up.

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2. Choose “Save this Image as” from the pop-up menu. Netscape will give it a default name that you might as well use. You can save it on the desktop, or wherever is convenient.
3. In JPEGView, open the saved image file with the “Open” (⌘-O) command, or drag the file’s icon onto the JPEGView icon.

To configure Netscape to open JPEGs with JPEGView, choose the “Helpers” tab from the “General Preferences” menu item. Click the “images/jpeg” line in the scrolling window, and then click the “Launch Application” radio button under Action in the bottom corner of the Preferences window. Click “OK.”

See Also

External Images; GIF; Helper Applications; Inline Images; JPEG; Netscape Navigator; Web Browser; World Wide Web

Jughead

A service for searching that enables searching through large numbers of **Gopher** sites on the Internet so that users can locate specific files quickly and easily.

Jughead differs from **Veronica**, another Gopher search utility, because Veronica usually returns large amounts of information to search queries, whereas Jughead searches can be more focused. (Like Veronica, Jughead refers to the Archie comic strip, because Veronica servers perform Archie-

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like collections of information, only for Gopher rather than FTP sites.) Jughead is “officially” an acronym for *Jonzy’s Universal Gopher Hierarchy Excavation and Display*.

Jughead is generally used to limit the range of a search to a certain machine, and to limit it to directory titles. Jughead, therefore, is more useful than Veronica if you know where you want to search, or if you are searching only on a Gopher server that runs Jughead.

To find a Jughead server, do a Veronica search (not case-sensitive) for “jughead -t7.” Doing so will return a list of all searchable Jughead servers.

See Also

Gopher; Internet Starter Kit; Veronica

Juilliard Music Adventure

Juilliard is the place to go if you’re serious about music. The Juilliard Music Adventure is designed to appeal to kids aged 9 and up who really don’t know much about music, but are starting to get interested. It’s not for the kid next door who started playing violin at age 3 and composed her first symphony in first grade. Even though the puzzles are complex enough to require some thought and some time, for reasons known only to the people who wrote this program, they choose not to use standard musical notation. Instead there are equally complicated melody and rhythm lines in a sort of diagram format.

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You select a tile and drag the dots on it up and down to raise and lower pitch. That's not quite the way Mozart did it. There's no good reason not to use "real" notes and a "real" staff. That aside, the program does teach quite a bit about rhythm and melody. Kids can compose their own music by selecting rhythm tiles and editing the melody. Then they can play back their compositions on a variety of instruments. The sound quality is good, even on the Mac's internal speaker.

There's also a game, requiring the user to visit five rooms in a castle and solve a different melody or rhythm puzzle in each. Doing so earns keys which eventually unlock the door to the throne room, where the user can compose music. Of course, users can do that without playing the game at all. Just stay outside the castle and the composition tools (such as they are) will stay outside as well. Kids who take their music lessons seriously will find this program rather limiting, but it's a good introduction for the absolute beginner.

Jump Cut

In video editing, a jump cut is a cut from one clip to another that is visually jarring to the viewer.

See Also

Cut; L-Cut; Transition

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Justification

Justification is a process that fits lines of type into a column so that both ends of the line are flush with the margins. It adds or subtracts from the amount of space between words so that the line extends from all the way from the left margin to the right. If the last line of a text block is short, it may be necessary to adjust the justification so that line ends normally. Otherwise, the words may be spread out too far, making them difficult to read. Most texthandling programs including word processors, chartmaking, and desktop publishing applications will automatically justify text. Select the block to be justified and select justify from the tool bar or dialog box.

See Also

Printing Terms