**FFmpeg Basics**

多媒体处理与快速音视频编码器

Frantisek Korbel

半棵树（译）

**FFmpeg Basics**

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Book index, user forum and other resources

are available on the website ffmpeg.tv.

ISBN: 1479327832

ISBN-13: 978-1479327836

**致谢**

The greatest thanks belongs to the developers of excellent FFmpeg tools and libraries and to the whole

FFmpeg community that drives this project forward. The project documentation was the main source for

the book.

Another great source was the Wikipedia, especially articles about color spaces, quantization, sampling, etc.

Thank you very much and best wishes.

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**介绍**

欢迎

亲爱的读者,

欢迎使用本书，本书讲述FFMPEG项目很多有趣的功能，功能如下:

\* Facebook 最大的社交网络，使用ffmpeg工具处理视频

\* 谷歌浏览器，流行的Web浏览器，使用FFmpeg库支持HTML5音频和视频

\* YouTube，最大的视频分享网站，使用ffmpeg转换上传视频

此书的重点是解释基本的视频编辑，如大小调整，裁剪，填充，去噪，覆盖等，本章介绍了如何将数字音频和创建音频，高级的声音处理的几批处理文件和高级技术。

**第一步**

第一步是下载FFmpeg二进制文件，文件可在专门的网站获得。许多Linux发行版已经安装ffmpeg工具或用户可以自己编译更高版本的二进制文件。

第一章关于ffmpeg项目基本信息和如何简化工作的工具。如果你已经掌握了这些技术，你可以移动到第二章开始进入各种FFMPEG命令。

请注意，本书中的许多命令被简化，主要是说明当前的功能和一些参数。

专门的网站

在专业网站ffmpeg.tv 可以找到本书。

\* 本书目录，表格和介绍

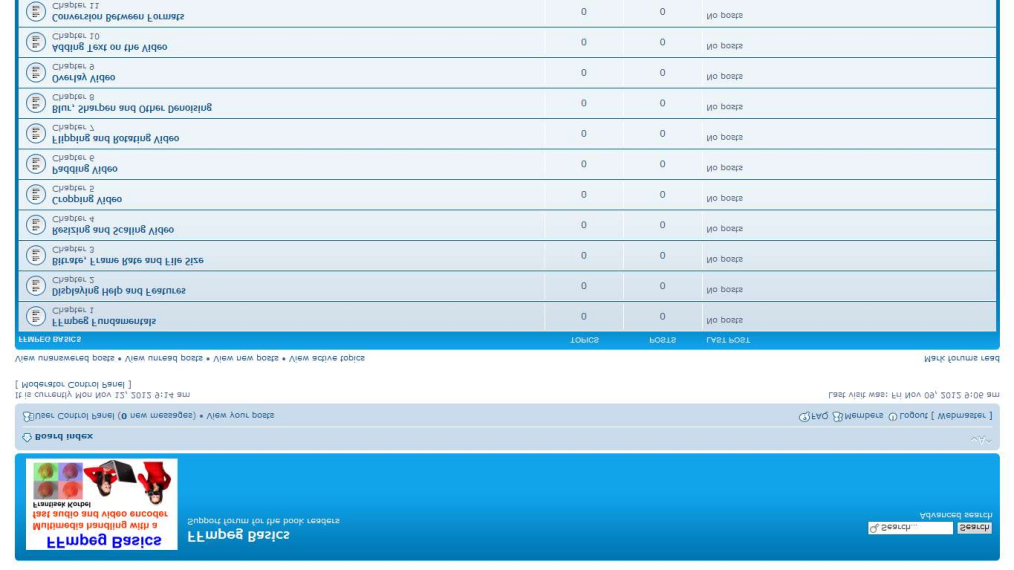
\* 从书中可以看视频操作的例子

\* 用户可以在论坛相关的主题中发表自己的想法

\* 错误列表

\* 联系方式

\* 邮件列表



**约定**

命令行中输入的文本应以斜体字体打印，例如:

ffmpeg -i input.mpg -q 1 output.avi

一个特定的文本替换命令的部分应该用斜体字印刷的，例如:

ffmpeg -i input -vf mp=denoise3d -s vga output

控制台输出以斜体字体打印:

Muxer avi [AVI (Audio Video Interleaved)]:

Common extensions: avi.

Mime type: video/x-msvideo.

Default video codec: mpeg4.

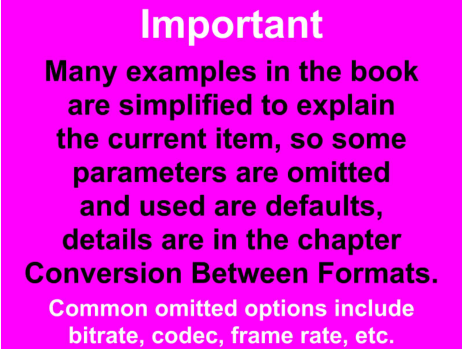
Default audio codec: mp3.

符号 ^ 表示命令太长无法在一行印刷的书继续另一个，但它仍然是一个1计算机命令，例如:

ffplay -f lavfi -i color=c=white ^

-vf drawtext=fontfile=/Windows/Fonts/arial.ttf:text=Welcome

请注意，在前面的例子中，在命令行上也需要有空白表示空格。这种形式的符号主要是批处理文件所需的部分解释。



本书让我们更好的使用色分化、素像过滤器、设备、数据源...等功能

|  |  |
| --- | --- |
| 彩色、设备、过滤器 例如：音频和视频相关的设备 | |
| 只有音频 |  |
| 只有视频 |  |
| 视频和音频 |  |



你的反馈是非常重要的，在200页左右的书中不能完全解释许多选项和ffmpeg工具参数。你有什么意见或改进可以反馈给我们，我们争取在下一个版本中概述。

你可以通过邮箱、论坛、www.ffmpeg.tv常见问题、其它搜索等提出。

非常感谢



**1. FFmpeg 基础**

正确使用和优化ffmpeg，如果你想直接使用，可跳过本章进入下一章。

FFmpeg 介绍

FFmpeg是基于GNU公共许可证下的多媒体处理软件项目，最受欢迎的部分是视频和音频编码/解码 以及操作速度快、输出文件大小较小等。FF在ffmpeg中意味着快速前进按钮，“MPEG”是一个运动图像专家组的缩写，FFmpeg处理LOGO包含锯齿形图案，熵编码方案与图片中的8x8块特征。



|  |  |
| --- | --- |
| FFmpeg 命令行工具 | |
| ffmpeg | 快速音/视频编解码 |
| ffplay | 多媒体播放器 |
| ffprobe | 显示媒体文件特性 |
| ffserver | HTTP和RTSP协议的流媒体服务器 |
| FFmpeg 软码库 | |
| libavcodec | 各种多媒体编解码器的软码库 |
| libavdevice | 设备软码库 |
| libavfilter | 过滤器的软码库 |
| libavformat | 媒体格式软码库 |
| libavutil | 各种辅助程序的软码库 |
| libpostproc | 后台处理软件库 |
| libswresample | 音频重采样软件库 |
| libswscale | 媒体缩放软件库 |

所有项目的代码都是C语言，可以在Linux / UNIX，Windows，Mac OS X等编译。

本书是参考微软Windows使用官方二进制文件的，所有的指令和例子都可以跨平台使用，请参阅有关选项和FFmpeg配置项。

**FFmpeg 开发**

开发人员如下：

|  |  |  |
| --- | --- | --- |
| Name | Location | Specialization |
| Baptiste Coudurier | Los Angeles USA | He has special expertise in broadcast codecs (ProRes, DNxHD,  IMX/D-10, AVC-Intra), formats (MXF, GXF, MOV) and  usages (Avid, FCP, Interlacing, Time Code, Metadata). |
| Benjamin Larsson | Stockholm,  Sweden | Main area of his expertise is audio codecs. |
| Diego Biurrun | Aachen,  Germany | He has special expertise in license compliance engineering and  build systems. |
| Jason Garrett-Glaser | Los Angeles,  USA | He is the lead x264 developer and has special expertise in  H.264 and other modern lossy video formats, as well as x86  SIMD assembly optimization. |
| Luca Barbato | Torino, Italy | He has special expertise in streaming protocols. |
| Michael Niedermayer | Vienna, Austria | He is an expert in all areas of video coding as well as x86  assembly. |
| Stefano Sabatini | Cagliari, Italy | He has special expertise in libavfilter, ff\* tools usage and  usability issues. |

**参与ffmpeg开发**

任何人都可以参与开发（http://www.ffmpeg.org/contact.html）。

邮件列表如下：

|  |  |
| --- | --- |
| FFmpeg mailing lists | |
| ffmpeg-user | for regular user questions like compilation troubles, command-line issues and similar |
| ffserver-user | for ffserver user questions like configuration and streaming issues |
| libav-user | for application developer questions about development using the FFmpeg libraries |
| ffmpeg-devel | for development of FFmpeg itself, it is not for development of software that use the  FFmpeg libraries and not for bug reports |
| ffmpeg-cvslog | for all changes to the FFmpeg sources / main git repository |
| ffmpeg-trac | for all changes to the FFmpeg Trac issuetracker |

**FFmpeg 下载**

下载地址：http://ffmpeg.org/download.html

执行文件下载：http://ffmpeg.zeranoe.com/builds

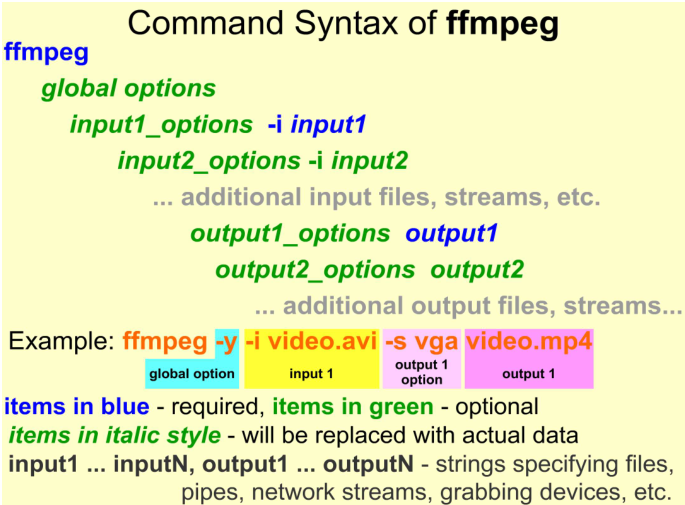
Linux版本安装编译：ffmpeghttp://www.evermeet.cx/ffmpeg or <http://ffmpegmac.net>

**命令行语法**

ffmpeg的命令行的语法是简单的，重要的是在正确的位置填写所需的参数类型，全局选项会影响所有的输入和输出：

ffmpeg [global options] [input file options] -i input\_file [output file

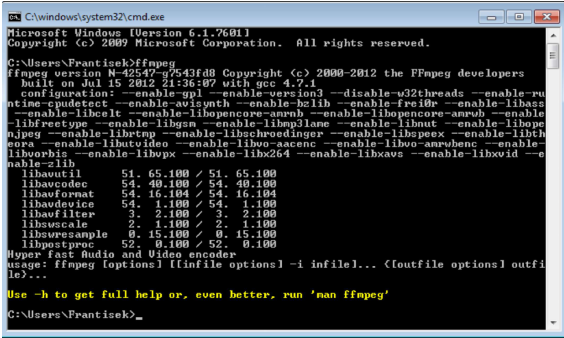
options] output\_file



**命令提示符及其设置**

通过如下流程设置FFmpeg命令行

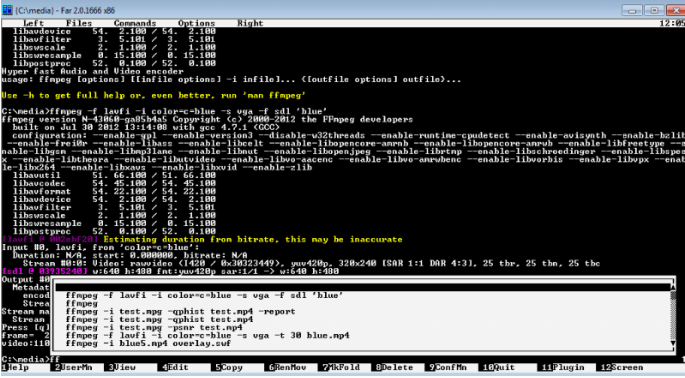
Windows -> All Programs -> Accessories -> Command Prompt. 通过快捷键 Win+R 输入 cmd。



Windows命令提示符可以使用额外的功能如文件操作、编译宏、ftp客户端等，下载地址如下：

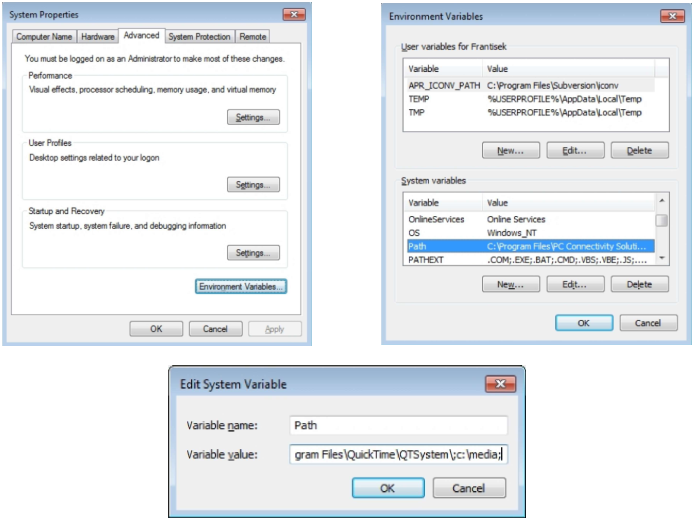
|  |  |  |
| --- | --- | --- |
| 命令提示符选项 | | |
| Name | Download | Description |
| FAR Manager | farmanager.com | - file manager with shell, editor, ftp client  - command line completion, shortcuts, macros, plugins  - 2 windows, customizable interface |
| PyCmd | sourceforge.net/projects/pycmd | - tab completion, persistent history... |
| Console | sourceforge.net/projects/console | - multiple tabs, configurable |
| Gregs DOS Shell | gammadyne.com/cmdline.htm#gs | - improved editing, command history, support for Aero  Glass, etc. |
| TCC/LE | jpsoft.com/all-  downloads/downloads.html | - includes 111 internal commands, 103 internal  variables, 140 variable functions |

远程管理器是一种文件管理器、编辑器和FTP客户端，支持宏、插件和其他高级功能等软件。用户界面可定制。命令历史窗口如下：



**路径设置**

FFMPEG命令行工具（ffmpeg.exe，ffplay.exe，ffprobe .exe）设置一个环境变量，让系统可以调用它，或者你可以复制ffmpeg程序到指定系统路径。如下图：



可以用命令设置路径：

set path=%path%;C:\path\_to\_ffmpeg.exe

例如,ffmpeg.exe 在C:\media 目录， 则输入命令：

set path=%path%;C:\media

**更改名称**

ffmpeg 有六个字母，感觉很繁琐，我们可以通过如下进行名称更改，这样可以节省时间和避免错误。

ren ffmpeg.exe f.exe

本书使用的是完整的ffmpeg 命令格式。

**Displaying output preview**

During various video tests, we can save plenty of time by displaying the command output directly on the

screen and not to save it to the file and than preview it in a media player.

**Preview with FFplay media player**

Instead of generating a new file with ffmpeg tool using the simplified command

**ffmpeg -i input\_file ... test\_options ... output\_file**

we can use the ffplay that will show exactly the same as ffmpeg saves to the file using the command

**ffplay -i input\_file ... test\_options**

**Preview with SDL output device**

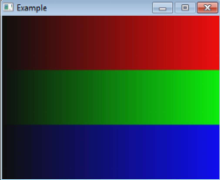
This preview is generated by an SDL (Simple DirectMedia Layer) output device described in the table:

|  |  |
| --- | --- |
| Output device: sdl | |
| Description | Shows a video stream in an SDL window, requires libsdl library installed. |
| Syntax | [-icon\_title i\_title] [-window\_size w\_size] [-window\_title w\_title] -f sdl output |
| Description of device’s options | |
| icon\_title | name of the iconified SDL window, defaults to the value of window\_title |
| window\_size | SDL window size, widthxheight or abbreviation, default is the size of the input video |
| window\_title | window title, defaults to the filename specified for the output device |

Please note, that SDL device can display only output with a yuv420p pixel format and with other input type

the option -pix\_fmt with a value yuv420p must be prepended, otherwise an error is displayed, for example:

**ffmpeg -f lavfi -i rgbtestsrc -pix\_fmt yuv420p -f sdl Example**



**SI prefixes available in FFmpeg**

When specifying numeric values to various ffmpeg options like bitrate or maximal file size you can use

common SI postfixes: K for kilo (10 3 ), M for mega (10 6 ), G for giga (10 9 ), etc. The next example specifies

a new bitrate 1.5 megabits per second for the output file, all commands give the same result: