



SmartCropper

Crop sheet music images fast!

User Guide

v1.2 (Apr 2021)

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Are you still worried about spending a lot of time cropping images of sheet music? This app will simplify this process into just one click, and most importantly, it's free!

Let's say you want to make a music score scrolling video - [like this one \(click to view\)](#). Traditionally, you need to manually select selections in the PDF sheet music (or output images), cut, and then number them in order (e.g., 01, 02, 03……) and save as images. You may be busy for half an hour before you can put the images into the video software to edit. Especially, for long music scores, the process of cutting is enough to keep you busy for a long time. However, with **SmartCropper**, it can be done in a flick of a finger, freeing up your hands. And! Not just for sheet music, **SmartCropper** makes it easy to process any image that requires "edge pagination", including books, magazines, forms, business cards and more!

SmartCropper is a green software, which requires no installation.

Just go to this URL: <https://github.com/Chen-and-Sim/SmartCropper/releases>

Download, open **SmartCropper.exe** and run it. Default interface is in English.

```
D:\SmartCropper.exe
-u [Path]           loadall [Path]          Load all images in the folder located at [Path]. [Path] can be either absolute or relative.
-f [Format]         format [Format]        Choose the format of output file(s). [Format] can be 'JPG' or 'PNG' in either upper or lower case.
-n [String]         name [String]         Set output filename to [String]. Available wildcards: %f - original filename; %s - index of selected area; %0s, %0Os etc. - add '0' in front of the index; %stx - begin numbering from x+. [DOES NOT DO ANY INPUT CHECK.]
-p [Path]           path [Path]          Set the path of output file(s) to [Path]. 'Desktop' in either upper or lower case is reserved for the shortcut to your desktop. [DOES NOT DO ANY INPUT CHECK.]
-c [Begin] [End]    create [Begin] [End]  Create an area that contains blocks ranging from [Begin] to [End].
-d [Number]         delete [Number]       Delete the selected area whose index is [Number].
-e [Num1] [Num2]    separate [Num1] [Num2] Separate the selected area [Num1] along the block [Num2]. The block [Num2] will belong to the former one of the separated areas.
-m [Begin] [End]    merge [Begin] [End]   Merge the selected areas whose indexes lie within [Begin] to [End].
-m [Beg] [End] [Num] modify [Beg] [End] [Num] Modify the selected area whose index is [Num]. The range of blocks in this area will be changed as from [Beg] to [End].
-v [Number]         preview [Number]     Preview the selected area whose index is [Number].
-b [Height] [Span] setmerge [Height] [Span] Set block height and span threshold for auto-merging.
-g [P] [Hor] [Ver]  enlarge [P] [Hor] [Ver] Enlarge the output image, so that the target image has an aspect ratio of [Hor]:[Ver] and a [P]% of margin space. It can be called with single parameter [P], and the default aspect ratio 16:9 is used.
-t [Value]          tolerance [Value]   Change the tolerance value to [Value]. A coloured pixel is more likely to be regarded as background if the value is set higher. The range is 0 to 255.

Please load an image.
smc>
```

Type the command -1 (Enter) to switch to the Chinese interface.



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◎ How to use

For example, to transfer this image (`pdf.png`) from sheet music PDF, you need to crop out each line of sheet music and save it in the following order by naming it.

pdf.png

01.png

02.png

03.png

04.png

With **SmartCropper**, you can do it in 3 steps.

◆ **Step 1: Load the image** Use the `load` command (short command: `-i`).

```
smc> load pdf.png (or: -i pdf.png)
```

* The program supports both relative and absolute paths. It is recommended to place the program in the same directory as the image, so that the previous path can be omitted.

◆ **Step 2: Wait for the program to automatically divide the image into constituencies**
This process will take a few seconds, and the list of constituencies will be displayed after the detection is complete.

◆ **Step 3: Save the file** Use the `save` command (short command: `-s`).

```
smc> save (or: -s)
```

After executing the command, the output file is saved to the specified folder (default: the `crops` folder in the same path as the program).

After the prompt succeeds, open the `crops` folder and you will see the cropped image.

You can use the `loadall` command (short command: `-u`) to merge **multiple pictures** (in the same path) into a large crop at **one time**.

`smc> loadall pdf` (or: `-u pdf`) (where `pdf` is the folder name and a relative/absolute path is available)

◎ Advanced usage

◆ **Specify the output filename:** use the `name` command (short command: `-n`).

The default format for output filenames is "original filename - serial number". If the original filename is `score`, the output filename will be "`score-1`, `score-2`, `score-3`.....". However, this can also be set manually with the `name` command (short command: `-n`). The following wildcards are available for filenames.

- `%f`: original file name
- `%s`: Serial number for selected areas
- `%0s`, `%00s`, etc.: automatically fill in the zeros before the serial number (as many zeros as there are before `s`).

For example, if you want the filename output to be "`001`, `002`, `003`.....", then type the command

`smc> name %00s` (or: `-n %00s`).

If you need to continue cutting after other output files, with serial numbers to follow, you can use the wildcard `%s+n`. If you have already cut five files, with names `score-1`, `score-2`,, `score-5`, and now want to start the new output with `score-6`, you can type the command

`smc> name %f-%s+5` (or: `-n %f-%s+5`).

◆ **Specify the path of output file:** Use the `path` command (short command: `-p`). The default path is the `crops` folder in the same path as the program; you can fill in `Desktop` (either in upper or lower case) to specify the path as the Windows desktop.

```
smc> path C:\output\ (or: -p C:\output\  
smc> path Desktop (or: -p Desktop)
```

◆ **Specify the format of output file:** Use the `format` command (short command: `-f`). PNG and JPG formats are supported.

```
smc> format JPG (or: -f JPG) (Both upper and lower case are accepted.)
```

◆ **Specify the aspect ratio of output file or add blank margins:** Use the `enlarge` command (short command: `-g`).

```
smc> enlarge 4 3 10 (or: -g 4 3 10)
```

The aspect ratio of the output file is 4:3, and a 10% margin is added.

```
smc> enlarge 10 (or: -g 10)
```

The aspect ratio of the output file is the default value 16:9, and a 10% margin is added.

◆ **Blocks and selections:** To use the advanced functions, we need to understand the concepts of "**blocks**" and "**selected areas**". This can be illustrated as the picture in the next page.

Those in red are "Blocks": the "physical partition" determined by the program based on horizontal/vertical rows (columns) of blank pixels.

Those in blue are "selected areas": a selected area eventually corresponds to a small picture. For an automatic partitioning of the score -- not "physical partitioning" but "artificial partitioning" -- it is built in that if the height of one of any two "blocks" is $\leq h$ (pixels), and if the vertical interval between the two blocks is $\leq s$ (pixels), then the program will automatically merge these blocks into a single selected area. Default: $h = 80$, $s = 30$; the values of h and s can be adjusted using the `setmerge` command (short command: `-b`).

Selected area 2 consists of blocks 2 – 4.

1 EARLY SUMMER RIPPLES 1

Adagio rubato. 2 Wenge CHEN (b. 1990)

2

3

4 * Always with the sordina pedal and the sostenuto pedal unless specified.

1 Andante.

5

3

4

(The example is the sample picture `example.png` that comes with **SmartCropper**.)

◆ **Preview a selected area:** After the program automatically detects and divides the picture(s) into selected areas, you can use the `preview` command (short command: `-v`) to preview the selected area.

`smc> preview 2` (or: `-v 2`)

Then selection #2 of that file (as shown below) will open the preview with the system's selected picture tool.

Adagio rubato. Wenge CHEN (b. 1990)

* Always with the sordina pedal and the sostenuto pedal unless specified.

The preview images are stored in a temporary folder. You can exit the program with the `quit` command (short command: `-q`) to delete the temporary folder.

◆ **Merge selected areas:** Use the `merge` command (short command: `-r`).

`smc> merge 1 3` (or: `-r 1 3`) Merges selected areas #1 to #3 into one selected area.

◆ **To delete a selected area:** use the `delete` command (short command: `-d`).

`smc> delete 2` (or: `-d 2`) Delete Selected area #2.

◆ **Separate a selected area:** Use the `separate` command (short command: `-e`).

`smc> separate 3 4` (or: `-e 1`)

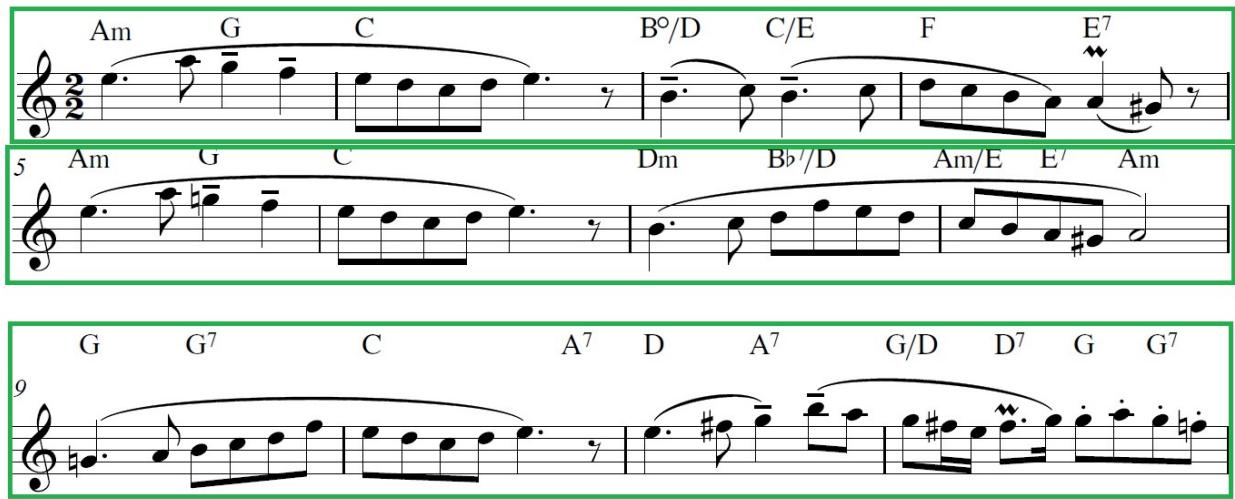
Separate the selected area numbered #3 along the block numbered #4. This block will belong to the former one of the separated areas.

◆ **Addressing adhesion and separation of selected areas:**

In the case of a poorly arranged score, auto-detected selected areas may "adhere" or "separate", as in the following case.

Am G C B°/D C/E F E⁷
5 Am G C Dm B^b7/D Am/E E⁷ Am
G G⁷ C A⁷ D A⁷ G/D D⁷ G G⁷
9

In this case, the first two rows of the score are mistaken for the same selected area because they are too close together and there is no entire row of blank pixels, while in the last row of the score the chord markers are separated from the notes by blank pixels, so they are also mistaken for separate selected areas. The correct partition should look like this.



There are two solutions to this problem: one is to edit and modify the original image so that the program can correctly identify the selected areas; the other is to use the following two techniques within the **SmartCropper** program, which are easier and faster:

◆ **Adjust the auto-merge block height and span:** Use the `setmerge` command (short command: `-b`).

For an automatic partitioning of the score -- not "physical partitioning" but "artificial partitioning" -- it is built in that if the height of one of any two "blocks" is $\leq h$ (pixels), and if the vertical interval between the two blocks is $\leq s$ (pixels), then the program will automatically merge these blocks into a single selected area. The program defaults to $h = 80$ and $s = 30$; however, for these special cases, leaving these two values default may result in misaligned selected areas. So we can set these two values higher:

```
smc> setmerge 100 50 (or: -b 100 50)
```

This solves most misalignment (separation, adhesion) problems of selected areas.

◆ **Adjust the tolerance value:** The program will automatically calculate the tolerance value every time a picture is loaded (in order to improve the speed, only diagonal pixels are taken into calculation and the minimum RGB value is taken). Colored pixels are more likely to be seen as background if the value of tolerance t is set (range 0 to 255) to a higher value. We can adjust the tolerance value manually with the `tolerance` command (short command: `-t`), e.g. set to 0.

```
smc> tolerance 0 (or: -t 0)
```

⚠ The first time you change the parameters may not work as well as you'd like. Try using the above commands to adjust the parameters repeatedly so that you can partition the score smoothly as normal even if you have a poorly arranged score.

◆ **Check the current program settings:** Use the command `settings` (short command: `-x`) to check the current program settings, including language, state and parameters.

`smc> settings` (or: `-x`)

Sample output:

English Parameter Display	Chinese Parameter Display
Language: English	显示语言: 中文
Name of current file: example.png	当前文件名: example.png
Format of current file: PNG	当前文件格式: PNG
Path of current file: ./	当前文件路径 (相对) : ./
Name of output file(s): %f-%s	输出文件名 (含通配符) : %f-%s
Format of output file(s): PNG	输出文件格式: PNG
Path of output file(s): crops/	输出路径 (相对) : crops/
Number of images: 1	图片数量 (个) : 1
Number of blocks: 6	区块数量 (个) : 6
Number of selected areas: 4	选区数量 (个) : 4
Tolerance value: 21	容差值 (RGB) : 21
Auto-merge height threshold: 80	自动合并块高阈值 (像素) : 80
Auto-merge span threshold: 30	自动合并跨度阈值 (像素) : 30
Proportion of margin: 0	边缘占比 (%) : 0
Aspect ratio: default	纵横比: 默认

◆ **More features:** For more features of **SmartCropper** and what's new in future versions, please refer to the "List of all commands and functions" at the end of this manual.

◎ Examples other than musical scores

The **SmartCropper** is not just for music scores! Any image that requires "edge pagination", including books, magazines, forms, business cards, etc., can be easily cut with **SmartCropper**!

◆ Cutting and saving/extracting text and pictures from books/theses:

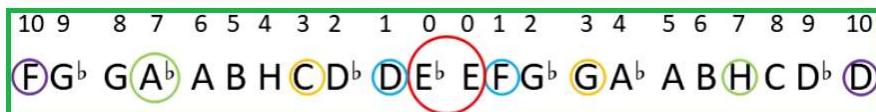


Figure 4.2: Intercept point with a dominant chord mirrored.

This provides us with a solution to invert all the dominant chords with their alterations and get the remaining minor chords. These are major Dominant chords, see figure 4.3

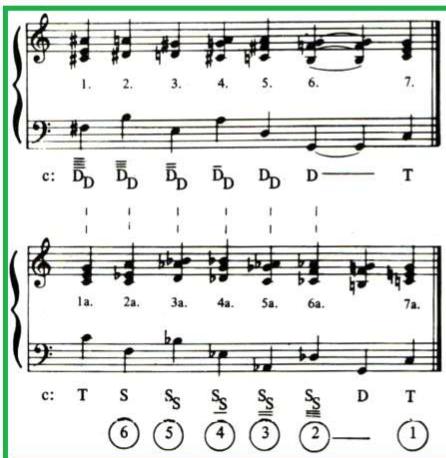


Figure 4.3: Major Dominant progression

(Source of the example: [Joel Bergström \(2018\). Chromatic Function Analysis: An instrument for function analysis, improvisation and composition](#))

◆ Web page image extraction, with white (black) edges removed:



◎ List of all commands and functions

Parameter-free commands

command	short command	explain
about	-a	Show program author information
help	-h	Show Help
language	-l	switch programming language
quit	-q	exit process
save	-s	Save the cropped image
settings	-x	Show current settings

Commands that require parameters

command	short command	explain
load [Path]	-i [Path]	Load an image. [Path] can be either absolute or relative, including extension.
loadall [Path]	-u [Path]	Loads all the images in this path. [Path] can be either absolute or relative, including extension.
format [Format]	-f [Format]	Select the output file format. PNG and JPG (either in upper or lower case) are supported.
name [String]	-n [String]	Set the output filename to [String]. Available wildcards : %f - original filename; %s - index of selected area; %0s , %00s, etc. - add zero in front of the index.
path [Path]	-p [Path]	Set the path of output files to [Path]. Inputting Desktop (either in upper or lower case) will save the files to the desktop. The default path is the crops folder in the same path as the program.
create [Begin][End]	-c [Begin][End]	Create a selected area containing blocks [Begin] ~ [End].
Delete [Number]	-d [Number]	Delete the selected area with serial number [Number].

separate [Area] [Block]	-e [Area] [Block]	Separate the selected area [Area] along the block [Block]. This block will belong to the former one of the separated areas.
Merge [Begin] [End]	-r [Begin] [End]	Selected areas numbered [Begin] to [End] are merged into one selected area.
modify [Begin] [End] [Number]	-m [Begin][End] [Number]	The selected area with serial number [Number] is changed to include blocks numbered [Begin] to [End].
preview [Number]	-v [Number]	Preview the selected area with serial number [Number]. The file is opened with the system-default picture tool.
setmerge [h][s]	-b [h][s]	Set the auto-merge threshold for selected areas (default: $h = 80, s = 30$)* .
enlarge [P][Hor][Ver]	-g [P][Hor][Ver]	Enlarge the output image, so that the target image has an aspect ratio of [Hor]:[Ver] and a [P]% of margin space. It can be called with single parameter [P], and the default aspect ratio 16:9 is used.
tolerance [t]	-t [t]	Set the tolerance t ** for auto edge detection.

* **Auto-merge threshold** [h][s]: For an automatic partitioning of the score, if the height of one of any two "blocks" is $\leq h$ (pixels), and if the vertical interval between the two blocks is $\leq s$ (pixels), then the program will automatically merge these blocks into a single selected area.

** **Tolerance value** [t]: Colored pixels are more likely to be seen as background if the value of tolerance t is set (range 0 to 255) to a higher value.

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GitHub: <https://github.com/rcswex>

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We also recommend using our free and open source --



<https://github.com/Chen-and-Sim/ChordNova>



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