

Virtual Vellum Collator: User Guide

Collator is designed to convert images (either in batches or individually) to JPEG 2000, which can be used with Virtual Vellum. The software additionally generates the necessary XML files and structure that are required by Virtual Vellum to index and display the image collection. This document provides an overview of the software functionality within Collator.

1 Installing and Running Collator

To install Collator, extract all of the files within the ZIP file download into the same folder. This should include 4 DLL files (JP2Encoder.dll, jpeg62.dll, libtiff3.dll and zlib1.dll), 2 EXE files (Collator.exe and vcredist_x86.exe) and this file.

Collator can be launched by running the Collator.exe application.

General Notes:

- Collator is a Windows-based application and therefore will only run under a Windows platform,
- Collator has been compiled using a relatively new version of Microsoft's Visual C runtime libraries (May 2007) which are located on a windows PC as standard. The updated libraries should be installed during a Windows Update however if you experience any problems when attempting to launch Collator, the new versions of the libraries can be installed by launching the vcredist_x86.exe application (a restart may be necessary). Once Collator successfully launches, the vcredit_x86.exe file can be deleted.
- Depending on how you have your operating configured, you may not see the file extensions when browsing the folder that contains the software,

2 Using Collator

When Collator is launched you will be presented with a dialog box similar to that shown in Figure 1. The interface is divided into 3 regions: Image Properties, JPEG 2000 Settings and Encoding Status. These are discussed in the following sections.

2.1 Image Properties

The Image Properties section of the application allows you to specify which images you wish to convert and enter supported metadata about them. The first step is to select a folder that contains the source images you wish to process. To do this you can either type the path directly into the "Source folder:" text field or use the corresponding "Browse..." button to browse for the folder. Once a folder is selected, Collator will enumerate the folder for all supported images and display them in the list window. Supported images formats include TIF, PGX, PNM, PGM, PPM, BMP and JPG, although it is recommended that the source images are in a non-lossy format (i.e. not JPG).

Using the "Destination folder:" text field you should enter the root location that will contain the resulting processed images and XML file(s). You can either type directly

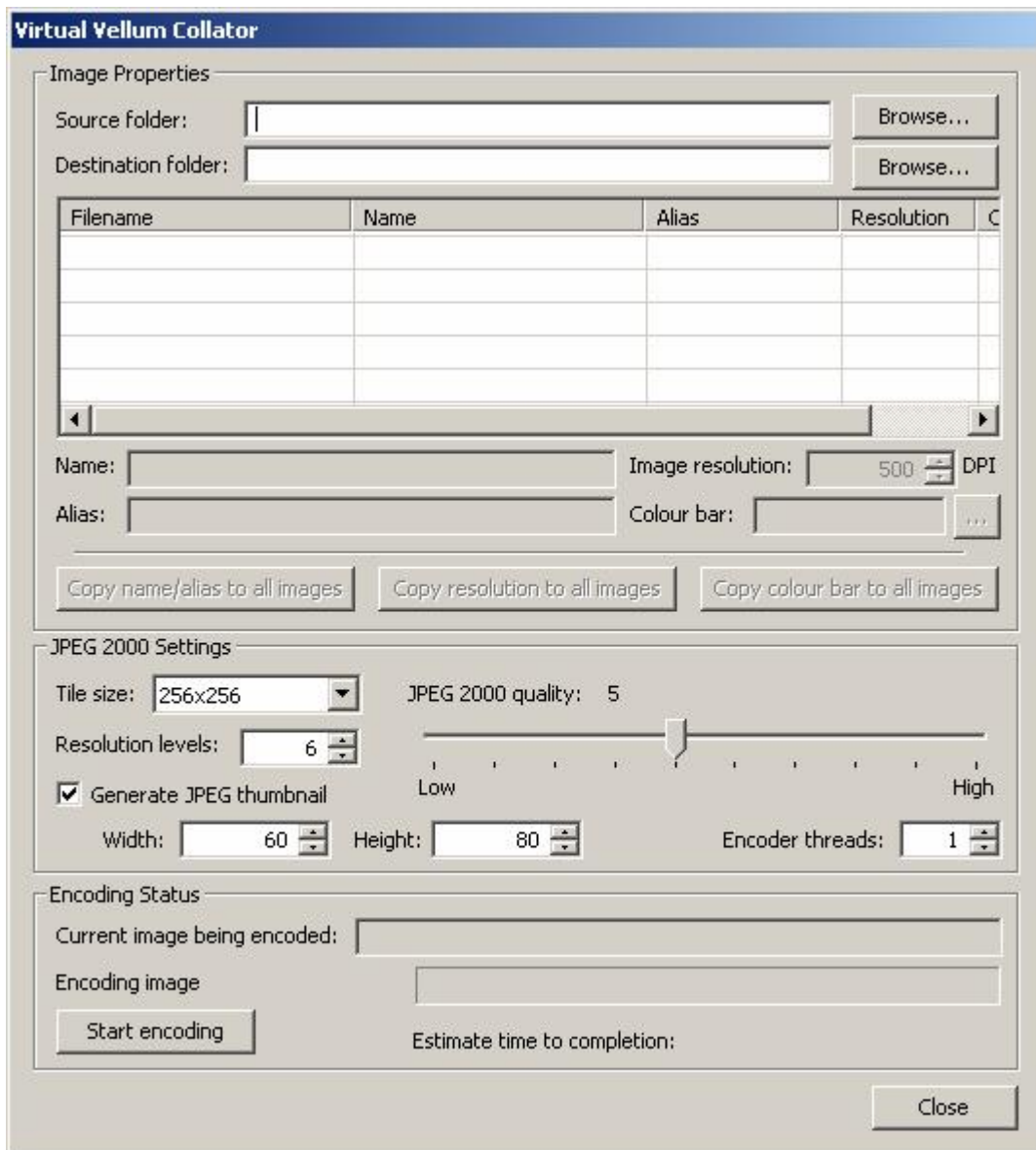


Figure 1: The dialog box that is displayed when Collator is launched

into this box or located a folder by clicking on the appropriate “Browse...” button. During the conversion process, if the destination folder does not exist then it will be created automatically.

The region directly below the source and destination folder text fields provides a list of all the supported images that have been found in the source folder. The image list allows you to select which images you wish to process by checking (selected) or unchecking (not selected) the check-icon to the left of the image filename. Additional checking options are available via the popup menu that appears when right-clicking anywhere within the image list region. The popup menu provides operations to select all, select none and invert selected.

Alongside the image filename, the image list displays metadata about each image. The first step required to modify the metadata is to select the appropriate image. When an image is selected, the name, alias, image resolution and colour bar text fields become active. The image metadata can then be changed by modify the contents of

the corresponding text field. The metadata displayed in the image list is dynamically updated as the text fields are change. Metadata properties that are common to all the images can be quickly set using the appropriate “Copy... to all images” button.

Note: The rulers will only be available within Virtual Vellum if an image resolution is specified in the metadata. Similarly the colour bar option will only be available within Virtual Vellum if a colour bar image is associated with an image using the metadata fields.

2.2 JPEG 2000 Settings

The JPEG 2000 Settings region allows you to change some of the encoder properties.

Tile size: Each image is segmented into regions called tiles. When an image is viewed, only the tiles that are of immediate interest are decoded. This reduces the need for the whole image to be decoded however each tile that is decoded incurs a slight performance overhead. A balance between tile size, to reduce the amount of off-screen image that is decoded, and the overall number of tiles the image is segmented into needs to be balanced. The default value uses a tile size of 256x256.

Resolution levels: It is conceivable that the full detail of the tile is not always required, for example if the image were to be viewed at a magnification level of 10%. Therefore completely decoding a tile to reduce its visual dimensions can be wasteful. The inclusion of resolution levels alleviates this problem by taking scaled versions of the tile and progressively encoding them (the size at each resolution level is half that of the previous level). This allows the decoder to only decode the tile to a suitable resolution level that most closely matches the target visual dimensions. Similar to the tile size, there is a slight performance overhead per resolution level therefore a balance between the two competing aspects is required. The default resolution level is 6.

JPEG 2000 quality: This slider allows you to change the encoding quality (the encoder interface assumes it will always be a lossy conversion). Increasing the quality will result in a less lossy reproduction of the image but produces a larger file size. Decreasing the quality will result in a more lossy reproduction of the image but produces a smaller file size. The default value is 5, which provides an image that is visually indistinguishable from the source.

Generate JPEG thumbnail: Through the use of multiple resolution levels, a thumbnail can be extracted from the JPEG 2000 image file without the need of decoding the whole image. However, it is still more computationally efficient to save a thumbnail of the image as a JPEG, which can be more quickly loaded and displayed to the user to help them determine whether this is the image they are interested in. When this option is checked, thumbnail images will be created using the width and height dimensions provided. The image will be scaled to best fit the width and height of the thumbnail while maintaining its aspect ratio. Where the image doesn't take up the full thumbnail width or height values, black borders are used.

Encoder threads: If you run Collator on a machine that has multiple cores, or is a single core machine with Hyperthreading technology, you can use each core

to encode multiple images asynchronously. You should set this parameter to indicate the number of processors your machine has but at the same time ensure you have enough physical memory to run multiple encoder threads without paging to hard disk. If the operating system needs to use the hard disk as a store for extra working memory (virtual memory\swap file\paging file) the transfer between this and the physical memory will bottleneck the encoding process and you will not be using the processor(s) time to its full potential. Instead of increasing the encoder throughput, it is possible to seriously reduce it when paging starts to occur. As a rule of thumb, each encoder needs twice as much memory as the uncompressed source image (e.g. if the biggest source uncompressed TIF image is 140MB, you will require approximately 280MB of free working physical memory). Increasing the number of encoder threads beyond the number of processors in your machine will provide no further benefit.

2.3 Encoding Status

The final section of the Collator application provides the functionality to start and stop the encoding process. Feedback is given when encoding images in the form of the current source image, the progress through the source image list and an estimated time to completion (note, this will only be given after the first image has been encoded). When a source image has been encoded, its corresponding check box option in the image list is unchecked. When an encoding process is stop, it continues to process the current image before finishing. Please note that a stop/start operation will keep all images that have already been generated, but the XML file will be overwritten if you use the same destination folder.

When the encoding process is complete, the file structure and XML files are ready as they are to be used with Virtual Vellum.