CLAIMS

1. A method for compressing a digital image in a computing device, the method comprising:

dividing an image into a plurality of image sub-regions;

selecting from a dictionary including a plurality of predetermined template patterns wherein each template pattern comprises a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and wherein each said template pattern is identified by a code, a template pattern for each sub-region that most closely matches one or more image features of that sub-region; and

generating a compressed data set for the image, in which each sub-region is represented by a code identifying the template pattern selected therefor.

2. The method of claim 1, wherein the dictionary is determined before a first sub-region is analyzed.

3. The method of claim 1, wherein the dictionary is adjusted as one or more sub-regions are analyzed.

4. The method of claim 1, wherein, if none of the plurality of template patterns in the dictionary sufficiently matches the image sub-region, a new template pattern is generated and added to the dictionary for compressing the image sub-region.

5. The method of claim 1, wherein the image is divided geometrically to generate a pre-determined number of sub-regions having pre-determined dimensions.

6. The method of claim 1, wherein the image is divided based on image content.

7. The method of claim 6, wherein the boundaries between sub-regions coincide with image content boundaries having significant changes in image features.

8. The method of claim 1, comprising selecting a plurality of template patterns for each sub-region, wherein each pattern is selected for a different image feature.

9. ~~The method of claim 1, comprising decompressing~~A method for compressing and decompressing a digital image in a computing device, the method comprising:

dividing an image into a plurality of image sub-regions;

selecting from a dictionary including a plurality of predetermined template patterns wherein each template pattern comprises a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and wherein each said template pattern is identified by a code, a template pattern for each sub-region that most closely matches one or more image features of that sub-region; and

generating a compressed data set for the image, in which each sub-region is represented by a code identifying the template pattern selected therefor, wherein the compressed image may be decompressed by using the code to retrieve the template pattern from the dictionary for each sub-region, reconstructing a full image by combining the template patterns for all of the sub-regions, and displaying the reconstructed image.

10. The method of claim 1, wherein each sub-region is further represented by a difference value representing the difference in one or more image features between the image sub-region and the template pattern selected therefor, so as to generate lossless compression data.

11. ~~The method of claim 10, comprising decompressing~~ A method for compressing and decompressing a digital image in a computing device, the method comprising:

dividing an image into a plurality of image sub-regions;

selecting from a dictionary including a plurality of predetermined template patterns wherein each template pattern comprises a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and

wherein each said template pattern is identified by a code, a template pattern for each sub-region that most closely matches one or more image features of that sub-region; and

generating a compressed data set for the image, in which each sub-region is represented by a code identifying the template pattern selected therefor and further represented by a difference value representing the difference in one or more image features between the image sub-region and the template pattern selected therefor, so as to generate lossless compression data, wherein the compressed image may be decompressed by using the code to retrieve the template pattern from the dictionary for each sub-region and the difference value for one or more image features, reconstructing a

lossless replica of the full image by combining the template patterns and the difference values for all of the sub-regions, and displaying the reconstructed image.

12. A system for compressing a digital image, the system comprising:

a storage unit to store a dictionary having a plurality of predetermined template patterns, wherein said template patterns comprise a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and wherein each said template pattern is identified by a code;

a decomposition module to divide the image into a plurality of sub-regions; and a compression module to select a template pattern from the dictionary that most closely matches an image feature for each sub-region and to generate a compressed data set for the image in which each sub-region of the image is represented by a code identifying the template pattern selected therefor.

13. The system of claim 12, comprising a computing device to determine the dictionary before the compression module analyzes a first sub-region of the image.

14. The system of claim 12, wherein the dictionary is adjusted as one or more sub-regions are analyzed.

15. The system of claim 12, wherein if the compression module determines that none of the plurality of template patterns sufficiently matches an image sub-region, the compression module generates a new template pattern and the storage unit adds the new template pattern to the dictionary for compressing the image sub-region.

16. The system of claim 12, wherein the decomposition module divides the image geometrically into a pre-determined number of sub-regions having pre-determined dimensions.

17. The system of claim 12, wherein the decomposition module divides the image based on image content.

18. The system of claim 17, wherein the decomposition module identifies image content boundaries having significant changes in image features and automatically divides the image along the image content boundaries.

19. The system of claim 12, wherein the compression module selects a plurality of template patterns for each sub-region so that each pattern most closely matches the sub- region for a different image feature.

20. A system for compressing and decompressing a digital image, the system~~The system of claim 12,~~ comprising:

a storage unit to store a dictionary having a plurality of predetermined template patterns, wherein said template patterns comprise a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and wherein each said template pattern is identified by a code;

a decomposition module to divide the image into a plurality of sub-regions; and a compression module to select a template pattern from the dictionary that most closely matches an image feature for each sub-region and to generate a compressed data set for the image in which each sub-region of the image is represented by a code identifying the template pattern selected therefor;

a decompression unit to decompress the compressed image to reconstruct the image, wherein the decompression unit uses the code from the compressed data set to retrieve the template pattern from the dictionary for each sub-region and reconstructs a full image by combining the template patterns for all of the sub-regions; and

an output device to display the reconstructed image.

21. A system for compressing and decompressing a digital image, the system comprising:~~The system of claim 12,~~

a storage unit to store a dictionary having a plurality of predetermined template patterns, wherein said template patterns comprise a plurality of image features, properties, or variables such as colour, colour gradient, gradient direction, or reference pixel, and wherein each said template pattern is identified by a code;

a decomposition module to divide the image into a plurality of sub-regions; and a compression module to select a template pattern from the dictionary that most closely matches an image feature for each sub-region and to generate a compressed data set for the image in which each sub-region of the image is represented by a code identifying the template pattern selected therefor;

wherein the compression module further represents each sub- region by the difference in one or more image features between the sub-region and the template pattern selected therefor so as to generate lossless compression data.

22. The system of claim 21, comprising:

a decompression unit to decompress the compressed image to reconstruct the image, wherein the decompression unit uses the code from the compressed data set to retrieve the template pattern from the dictionary and the difference value for one or more image features for each sub-region, and reconstructs a full lossless image by combining the template patterns and the difference values for all of the sub-regions; and

an output device to display the lossless reconstructed image.