CLAIMS

1. An image predictive encoding device comprising:

region division means for dividing an input image into a plurality of regions;

prediction information estimation means for producing a prediction signal of a target region, the target region included among the plurality of regions, and the prediction signal produced from a reconstructed signal, the prediction information estimation means also for obtaining prediction information that is used to produce the prediction signal, the prediction signal being prediction information associated with the target region;

prediction information encoding means for encoding the prediction information associated with the target region;

decision means for making a comparison of the prediction information associated with the target region and prediction information associated with a neighbouring region located neighbouring the target region, the decision means also for deciding, based on a result of the comparison, whether the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

region width determination means for determining a region width of a partition that is included in the target region, the region width determined by the region width determination means when it is decided by the decision means that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

region width encoding means for encoding information identifying the region width;

prediction signal production means for producing the prediction signal of the target region from the reconstructed signal using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

residual signal production means for producing a residual signal between the prediction signal of the target region and an original signal of the target region;

residual signal encoding means for encoding the residual signal;

residual signal restoration means for producing a decoded residual signal by decoding encoded data of the residual signal;

adding means for producing a reconstructed signal of the target region by adding the prediction signal to the decoded residual signal; and

storage means for storing the reconstructed signal of the target region as the reconstructed signal.

2. The image predictive encoding device according to Claim 1, wherein when deciding that the prediction information associated with the target region and the prediction information associated with the neighbouring region are identical, the decision means does not use the prediction information associated with the neighbouring region to produce the prediction signal of the target region.

3. The image predictive encoding device according to Claim 1, wherein when deciding that a combination of the prediction information associated with the target region and the prediction information associated with the neighbouring region fails to satisfy a predetermined condition, the decision means also decides not to use the prediction information associated with the neighbouring region to produce the prediction signal of the target region.

4. The image predictive encoding device according to Claim 1, wherein when the decision means decides not to use the prediction information associated with the neighbouring region to produce the prediction signal of the target region, the region width encoding means does not output encoded data of the region width.

5. The image predictive encoding device according to Claim 1, wherein the neighbouring region comprises two neighbouring regions, a first neighbouring region being positioned left of the target region and a second neighbouring region being positioned on top of the target region, and

when the decision means decides that prediction information associated with both of the two neighbouring regions can be used to produce the prediction signal of the target region, the region width encoding means encodes identification information that identifies the neighbouring region as being used to produce the prediction signal of the target region from the two neighbouring regions.

6. An image predictive decoding device comprising:

data analysis means for extracting, from compressed data which has been produced by dividing an image into a plurality of regions and encoding the regions, encoded data of prediction information associated with a target region that has been used to produce a prediction signal of the target region, encoded data of information identifying a region width of a partition in the target region where prediction information associated with a neighbouring region located neighbouring the target region has been used to produce the prediction signal, and encoded data of a residual signal;

prediction information decoding means for restoring the prediction information associated with the target region by decoding the encoded data of the prediction information associated with the target region;

decision means for making a comparison of the prediction information associated with the target region and the prediction information associated with the neighbouring region, and deciding, based on a result of the comparison, whether the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

region width decoding means for restoring the region width by decoding the encoded data of the information identifying the region width, the region width restored by the region width decoding means when it is decided by the decision means that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

prediction signal production means for producing the prediction signal of the target region from a reconstructed signal by using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

residual signal restoration means for restoring a decoded residual signal of the target region from the encoded data of the residual signal;

adding means for producing a reconstructed signal of the target region by adding the prediction signal of the target region to the decoded residual signal; and

storage means for storing the reconstructed signal of the target region as the reconstructed signal.

7. The image predictive decoding device according to Claim 6, wherein when deciding that the prediction information associated with the target region and the prediction information associated with the neighbouring region are identical, the decision means decides not to use the prediction information associated with the neighbouring region to produce the prediction signal of the target region.

8. The image predictive decoding device according to Claim 6, wherein when deciding that a combination of the prediction information associated with the target region and the prediction information associated with the neighbouring region fails to satisfy a predetermined condition, the decision means also decides not to use the prediction

information associated with the neighbouring region to produce the prediction signal of the target region.

9. The image predictive decoding device according to Claim 6, wherein when the decision means decides not to use the prediction information associated with the neighbouring region to produce the prediction signal of the target region, the region width decoding means sets the region width associated with the target region to zero.

10. The image predictive decoding device according to Claim 6, wherein the neighbouring region comprises two neighbouring regions, a first one of the neighbouring regions being left of the target region, and a second one of the neighbouring regions being on top of the target region, and

when the decision means decides that prediction information associated with both of the two neighbouring regions can be used to produce the prediction signal of the target region, the region width decoding means decodes identification information that identifies the neighbouring region used to produce the prediction signal of the target region from the two neighbouring regions.

11. An image predictive encoding method comprising:

a region division step for dividing an input image into a plurality of regions;

a prediction information estimation step for producing a prediction signal of a target region from a reconstructed signal, the

target region included among the plurality of regions, the prediction information estimation step also for obtaining prediction information associated with the target region, the prediction information associated with the target region used to produce the prediction signal;

a prediction information encoding step for encoding the prediction information associated with the target region;

a decision step for making a comparison of the prediction information associated with the target region and prediction information associated with a neighbouring region located neighbouring the target region and deciding, based on a result of the comparison, whether the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

a region width determination step for determining a region width of a partition that is included in the target region when it is decided in the decision step that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

a region width encoding step for encoding information identifying the region width;

a prediction signal production step for producing the prediction signal of the target region from the reconstructed signal by using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

a residual signal production step for producing a residual signal between the prediction signal of the target region and an original signal

of the target region;

a residual signal encoding step for encoding the residual signal;

a residual signal restoration step for producing a decoded residual signal by decoding encoded data of the residual signal;

a reconstructed signal production step for producing a reconstructed signal of the target region by adding the prediction signal to the decoded residual signal; and

a storage step for storing the reconstructed signal of the target region as the reconstructed signal.

12. An image predictive encoding program causing a computer to function as:

region division means for dividing an input image into a plurality of regions;

prediction information estimation means for producing a prediction signal of a target region from a reconstructed signal, the target region included among the plurality of regions, the prediction information estimation means also for obtaining prediction information that is used to produce the prediction signal, the prediction information associated with the target region;

prediction information encoding means for encoding the prediction information associated with the target region;

decision means for making a comparison of the prediction information associated with the target region and prediction information associated with a neighbouring region located neighbouring the target region and deciding, based on a result of the comparison,

prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

region width determination means for determining a region width of a partition that is included in the target region, the region width determined with the region width determination means when it is decided by the decision means that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region, and where the prediction information associated with the neighbouring region is used to produce the prediction signal;

region width encoding means for encoding information identifying the region width;

prediction signal production means for producing the prediction signal of the target region from the reconstructed signal by using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

residual signal production means for producing a residual signal between the prediction signal of the target region and an original signal of the target region;

residual signal encoding means for encoding the residual signal;

residual signal restoration means for producing a decoded residual signal by decoding encoded data of the residual signal;

adding means for producing a reconstructed signal of the target region by adding the prediction signal to the decoded residual signal; and

storage means for storing the reconstructed signal of the target region as the reconstructed signal.

13. An image predictive decoding method comprising:

a data analysis step for extracting, from compressed data which has been produced by dividing an image into a plurality of regions and encoding the regions, encoded data of prediction information that has been used to produce a prediction signal of a target region and is associated with the target region, encoded data of information identifying a region width of a partition in the target region, and encoded data of a residual signal, where prediction information associated with a neighbouring region located neighbouring the target region has been used to produce the prediction signal;

a prediction information decoding step for restoring the prediction information associated with the target region by decoding the encoded data of the prediction information associated with the target region;

a decision step for making a comparison of the prediction information associated with the target region and the prediction information associated with the neighbouring region, and deciding, based on a result of the comparison, whether the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

a region width decoding step for restoring the region width by decoding the encoded data of the information identifying the region width, the region width restored when it is decided in the decision step

that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

a prediction signal production step for producing the prediction signal of the target region from a reconstructed signal by using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

a residual signal restoration step for restoring a decoded residual signal of the target region from the encoded data of the residual signal;

a reconstructed signal production step for producing a reconstructed signal of the target region by adding the prediction signal of the target region to the decoded residual signal; and

a storage step for storing the reconstructed signal of the target region as the reconstructed signal.

14. An image predictive decoding program causing a computer to function as:

data analysis means for extracting, from compressed data which has been produced by dividing an image into a plurality of regions and encoding the regions, encoded data of prediction information associated with a target region and used to produce a prediction signal of the target region; encoded data of information identifying a region width of a partition in the target region, and encoded data of a residual signal, where prediction information associated with a neighbouring region located neighbouring the target region has been used to produce the prediction signal;

prediction information decoding means for restoring the prediction information associated with the target region by decoding the encoded data of the prediction information;

decision means for making a comparison of the prediction information associated with the target region and the prediction information associated with the neighbouring region and deciding, based on a result of the comparison, whether the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

region width decoding means for restoring the region width by decoding the encoded data of the information identifying the region width, the region width restored with the region width decoding means when it is decided by the decision means that the prediction information associated with the neighbouring region can be used to produce the prediction signal of the target region;

prediction signal production means for producing the prediction signal of the target region from a reconstructed signal by using the prediction information associated with the target region, the prediction information associated with the neighbouring region, and the region width;

residual signal restoration means for restoring a decoded residual signal of the target region from the encoded data of the residual signal;

adding means for producing a reconstructed signal of the target region by adding the prediction signal of the target region to the decoded residual signal; and

storage means for storing the reconstructed signal of the target region as the reconstructed signal.

CLAIMS

1. An image predictive decoding method comprising:

data extraction step for extracting, from compressed data where an image is divided into a plurality of regions and encoded, encoded data of prediction information that is used to produce a prediction signal of a target region, encoded data of partition information, and encoded data of a residual signal;

regional information restoration step for restoring the partition information by decoding the encoded data of the partition information;

prediction signal production step for, when specifying that the target region is divided into a first partition and a second partition from the restored partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method, (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with a neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal restoration step for restoring a reproduction residual signal of the target region from the encoded data of the residual signal;

signal production step for producing a reproduction signal of the target region based on the prediction signal of the target region and the reproduction residual signal; and

storage step for storing the reproduction signal of the target region as the reconstructed signal.

2. The image predictive decoding method according to Claim 1, further comprising a classification information restoration step for restoring classification information by decoding encoded data of the classification information,

wherein the neighbouring region is selected based on the classification information among a plurality of neighbouring regions neighbouring the target region to produce the prediction signal of the first partition.

3. The image predictive decoding method according to Claim 1 or 2, wherein the prediction information of neighbouring regions excluding the neighbouring region predicted by intra-picture prediction is selected among the plurality of neighbouring regions neighbouring the target region as the prediction information associated with the neighbouring region used to produce the prediction signal of the first partition.

4. An image predictive decoding device comprising:

data analysis means for extracting, from compressed data where an image is divided into a plurality of regions and encoded, encoded data of prediction information that is used to produce a prediction signal of a target region, encoded data of partition information, and encoded data of a residual signal;

prediction information decoding means for restoring the partition information by decoding the encoded data of the partition information;

prediction signal production means for, when specifying that the target region is divided into a first partition and a second partition from the restored partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with an neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal restoration means for restoring a reproduction residual signal of the target region from the encoded data of the residual signal;

signal production means for producing a reproduction signal of the target region based on the prediction signal of the target region and the reproduction residual signal; and

storage means for storing the reproduction signal of the target region as the reconstructed signal.

5. An image predictive decoding program causing a computer to function as comprising:

data analysis means for extracting, from compressed data where an image is divided into a plurality of regions and encoded, encoded data of prediction information that is used to produce a prediction signal of a target region, encoded data of partition information, and encoded data of a residual signal;

prediction information decoding means for restoring the partition information by decoding the encoded data of the partition information;

prediction signal production means for, when specifying that the target region is divided into a first partition and a second partition from the restored partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method, (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with a neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal restoration means for restoring a reproduction residual signal of the target region from the encoded data of the residual signal;

signal production means for producing a reproduction signal of the target region based on the prediction signal of the target region and the reproduction residual signal; and

storage means for storing the reproduction signal of the target region as the reconstructed signal.

6. An image predictive encoding method comprising:

region division step for dividing an input image into a plurality of regions;

prediction information estimation step for producing a prediction signal of a pixel signal of a target region among the plurality of regions from a reconstructed signal and obtaining prediction information that is used to produce the prediction signal, as prediction information associated with the target region;

prediction information encoding step for encoding the prediction information associated with the target region;

partition determination step for determining a partition that is the partition in

the target region and where the prediction information associated with the neighbouring region is used to produce the prediction signal;

partition encoding step for encoding information for specifying partition information showing the partition;

prediction signal production step for, when specifying that the target region is divided into a first partition and a second partition from the partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method, (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with a neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal production step for producing a residual signal between the prediction signal of the target region and the pixel signal of the target region;

residual signal encoding step for encoding the residual signal;

residual signal restoration step for producing a reproduction residual signal by decoding encoded data of the residual signal;

adding step for producing a reproduction signal of the target region by adding the prediction signal to the reproduction residual signal; and

storage step for storing the reproduction signal of the target region as the reconstructed signal.

7. The image predictive encoding method according to Claim 6,
wherein the neighbouring region is selected based on classification information among a plurality of neighbouring regions neighbouring the target region to produce the prediction signal of the first partition.

8. The image predictive encoding method according to Claim 6 or 7, wherein the prediction information of neighbouring regions excluding the neighbouring region predicted by intra-picture prediction is selected among the plurality of neighbouring

regions neighbouring the target region as the prediction information associated with the neighbouring region used to produce the prediction signal of the first partition.

9. An image predictive encoding device comprising:

region division means for dividing an input image into a plurality of regions;

prediction information estimation means for producing a prediction signal of a pixel signal of a target region among the plurality of regions from a reconstructed signal and obtaining prediction information that is used to produce the prediction signal, as prediction information associated with the target region;

prediction information encoding means for encoding the prediction information associated with the target region;

partition determination means for determining a partition that is the partition in the target region and where the prediction information associated with the neighbouring region is used to produce the prediction signal;

partition encoding means for encoding information for specifying partition information showing the partition;

prediction signal production means for, when specifying that the target region is divided into a first partition and a second partition from the partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method, (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with a neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal production means for producing a residual signal between the prediction signal of the target region and the pixel signal of the target region;

residual signal encoding means for encoding the residual signal;

residual signal restoration means for producing a reproduction residual signal by decoding encoded data of the residual signal;

adding means for producing a reproduction signal of the target region by

adding the prediction signal to the reproduction residual signal; and

storage means for storing the reproduction signal of the target region as the reconstructed signal.

10. An image predictive encoding program causing a computer to function as:

region division means for dividing an input image into a plurality of regions;

prediction information estimation means for producing a prediction signal of a pixel signal of a target region among the plurality of regions from a reconstructed signal and obtaining prediction information that is used to produce the prediction signal, as prediction information associated with the target region;

prediction information encoding means for encoding the prediction information associated with the target region;

partition determination means for determining a partition that is the partition in the target region and where the prediction information associated with a neighbouring region is used to produce the prediction signal;

partition encoding means for encoding information for specifying partition information showing the partition;

prediction signal production means for, when specifying that the target region is divided into a first partition and a second partition from the partition information, producing a prediction signal of the first partition from a reconstructed signal by using (i) mode information that specify an inter-picture prediction method, (ii) a reference picture number, and (iii) a motion vector, all of which are included in the prediction information associated with a neighbouring region neighbouring the first partition, and producing a prediction signal of the second partition from a reconstructed signal by using the prediction information restored from the encoded data of the prediction information;

residual signal production means for producing a residual signal between the prediction signal of the target region and the pixel signal of the target region;

residual signal encoding means for encoding the residual signal;

residual signal restoration means for producing a reproduction residual signal by decoding encoded data of the residual signal;

adding means for producing a reproduction signal of the target region by adding the prediction signal to the reproduction residual signal; and

storage means for storing the reproduction signal of the target region as the reconstructed signal.