CLAIMS

1. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

processing of calculating part of waveforms that show periodic movement specific to the organ between each of the frame images, or frequencies specific to the organ between each of the frame images based on the pixel values between each of the frame images;

processing of Fourier transforming the change of the image between each of the frame images;

processing of extracting a spectrum within a certain band, including a spectrum corresponding to part of waveforms that show periodic movement specific to an organ, or frequencies specific to an organ, from the spectrum obtained after the Fourier transform;

processing of performing inverse Fourier transform on the spectrum extracted from the certain band; and

processing of outputting each image after performing the inverse Fourier transform.

2. The diagnostic support program according to

claim 1, further comprising:

processing of dividing images of an organ of a human into a plurality of block areas and calculating a change in the image of the block areas in each of the frame images;

wherein the processing of Fourier transforming performs Fourier transform on the change in the image of each of the block areas in each of the frame images.

3. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

processing of calculating part of waveforms that show periodic movement specific to the organ between each of the frame images, or frequencies specific to the organ between each of the frame images based on the pixel values between each of the frame images;

processing of extracting pixels that change corresponding to part of waveforms that show periodic movement specific to the organ in the images, or frequencies specific to the organ in the images by a digital filter; and

processing of outputting images including the

pixels extracted by the digital filter.

4. The diagnostic support program according to claim 3, further comprising:

dividing images of an organ into a plurality of block areas and calculating a change in an image in block areas in each of the frame images; wherein

in the processing of extracting pixels that change corresponding to part of waveforms that show periodic movement specific to the organ in the images, or frequencies specific to the organ in the images by the digital filter, the pixels are extracted for each of the block areas by the digital filter.

5. The diagnostic support program according to claim 1, further comprising:

processing of calculating part of waveforms that show periodic movement specific to the organ between each of the frame images, or the change rate of frequencies specific to the organ between each of the frame images based on the pixel values between each of the frame images;

processing of selecting a color corresponding to part of waveforms that show periodic movement specific to the organ, or the change rate of frequencies specific to the organ; and

processing of adding the selected color on the change rate of the pixel values and displaying the images on a display.

6. The diagnostic support program according to claim 5, further comprising:

processing of dividing images of an organ into a plurality of block areas and calculating a change rate in an image in block areas in each of the frame images; wherein

in the processing of selecting a color corresponding to part of waveforms that show periodic movement specific to an organ, or the change rate of frequencies specific to the organ, the color is selected for each of the block areas.

7. The diagnostic support program according to claim 2, 4 or 6, wherein

the block areas are formed using the Voronoi partitioning technique.

8. A diagnostic support program that analyzes images of a human body and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

processing of calculating part of waveforms

that show periodic movement specific to the organ between each of the frame images, or frequencies specific to the organ between each of the frame images based on the pixel values between each of the frame images;

processing of defining an analysis range for all the acquired frame images;

processing of dividing the analysis range into a plurality of areas; and

processing of classifying each of the divided areas based on the index of part of waveforms that show periodic movement or frequencies.

9. The diagnostic support program according to any one of claims 1 to 11, wherein

the change in the pixel values of each of the frame images is calculated while maintaining absolute positional relationship of each pixel in a plurality of frame images.

10. The diagnostic support program according to claim 9, wherein

a plurality of frame images is classified into a plurality of groups, and a periodic change that characterizes the state of an organ is calculated while maintaining absolute positional relationship of each pixel in a plurality of frame images belonging to each group.

11. The diagnostic support program according to claim 2, 4 or 6, wherein

a change in an image in block areas in each of the frame images is calculated in a state where relative positional relationship of pixels indicating the organ is maintained between each of the frame images regardless of whether they are adjacent frames or not.

12. The diagnostic support program according to any one of claims 1 to 9, 10, and 11, further comprising;

processing of restoring transmittance changed from the transmittance of a specific area to a constant shape in frame images photographed by X-rays.

13. The diagnostic support program according to any one of claims 1 to 9, 10, and 11, further comprising;

processing of correcting a signal value in an area where a magnetic field of MRI is non-uniform in a frame image photographed by MRI and converting it into an image obtained when a magnetic field is uniform.

14. The diagnostic support program according to

claim 2, 4 or 6, wherein

a change rate is calculated from aspects of a change in the entire organ between each of the frame images regardless of whether they are adjacent frames or not, and a change in an image in the specific block areas is calculated based on the calculated change rate.

15. The diagnostic support program according to claim 14, wherein

the change rate changes depending on a position of block areas in the organ or is constant throughout the organ.

16. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

processing of calculating a periodic change that characterizes the state of organs between each of the frame images based on the pixel values between each of the frame images;

processing of Fourier transforming the change of the image between each of the frame images;

processing of extracting a spectrum within a certain band including a spectrum corresponding to

the frequency of movement of an organ from the spectrum obtained after the Fourier transform;

processing of performing inverse Fourier transform on the spectrum extracted from the certain band;

processing of outputting each image after the inverse Fourier transform;

processing of setting the maximum outer edge when the size of the organ is maximized;

processing of setting the minimum outer edge when the size of the organ is minimized;

processing of calculating the coefficient of the outer edge of an organ of another size in each image using the maximum outer edge and the minimum outer edge;

processing of displaying the waveform corresponding to the coefficient of the outer edge of the organ in each of the images and the control points of the waveform on a graph; and

processing of changing the coefficient of each image by changing the position of the control point.

17. The diagnostic support program according to claim 16, wherein
a pixel average value of the image of the organ is displayed on the graph.

18. The diagnostic support program according to claim 16 or 17, wherein

the image of the organ is displayed juxtaposed with the graph.

19. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

processing of dividing images of an organ of a human in each of the frame images into a plurality of block areas;

processing of calculating a change in an image in block areas in each of the frame images;

processing of Fourier-transforming the value of the change in each of the block areas; and

processing of classifying each area by colors based on a composition ratio of frequency components.

20. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

for each pixel in a specific frame image, processing of extracting pixels having coordinates different from each of the pixels in the next and subsequent frame images and calculating part of waveforms that show periodic movement specific to an organ, or frequencies specific to the organ between each of the frame images;

processing of Fourier transforming the change of the image between each of the frame images;

processing of extracting a spectrum within a certain band including a spectrum corresponding to part of periodic waveforms specific to an organ, or frequencies specific to an organ;

processing of performing inverse Fourier transform on the spectrum extracted from the certain band; and

processing of outputting each image after the inverse Fourier transform.

21. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

for each pixel in a specific frame image, processing of extracting pixels having coordinates different from each pixel in the next and

subsequent frame images and calculating part of waveforms that show periodic movement specific to an organ, or frequencies specific to the organ between each of the frame images;

processing of extracting pixels that change corresponding to part of waveforms that show periodic movement specific to the organ in the images, or frequencies specific to the organ in the images by a digital filter; and

processing of outputting images including the pixels extracted by the digital filter.

22. A diagnostic support program that analyzes images of an organ of a human and displays analysis results, the program causing a computer to execute a process comprising:

processing of acquiring a plurality of frame images;

for each pixel in a specific frame image, processing of extracting pixels having coordinates different from each of the pixels in the next and subsequent frame images and calculating part of waveforms that show periodic movement specific to an organ, or frequencies specific to the organ between each of the frame images;

processing of defining an analysis range for all the acquired frame images based on part of waveforms that show periodic movement specific to

an organ between each of the frame images, or frequencies specific to the organ between each of the frame images;

processing of calculating the change rate between each of the frame images in the analysis range;

processing of selecting a color corresponding to the change rate between each of the frame images; and

processing of adding the selected color and displaying the images on a display.