performing an inverse transform of the frequency transform using the frequency transformed data of the high pass filtered sample image data and the frequency transformed data of the high pass filtered repair image data to generate new high pass filtered repair image data;

combining the low pass filtered repair image data and the low pass filtered sample image data to generate low pass filtered image data;

generating new high pass filtered image data using the new high pass filtered repair image data, the repair image data and the noise mask; and

generating new image data using the new high pass filtered repair image data and the low pass filtered image data.

**14**. The method of claim **13**, further comprising the step of:

creating from the noise mask a soft noise mask having a soft edge,

wherein the step of generating new high pass filtered image data uses the new high pass filtered repair image data, the repair image data and the soft noise mask.

**15**. The method of claim **13**, further comprising the step of:

creating mask repair image data in accordance with the noise mask and the repair image data.

**16**. The method of claim **14**, further comprising the step of:

creating mask repair image data in accordance with the soft noise mask and the repair image data.

**17**. The method of claim **13**, wherein

the step of performing a frequency transform to the high pass filtered sample image data calculates a fast fourier transform of the high pass filtered sample image data to generate fast fourier transform data of the high pass filtered sample image data;

the step of performing the frequency transform to the high pass filtered repair image data calculates a fast fourier transform of the high pass filtered repair image data to generate fast fourier transform data of the high pass filtered repair image data; and

the step of performing an inverse transform of the frequency transform calculates an inverse fast fourier transform using the fast fourier transform data of the high pass filtered sample image data and the fast fourier transform data of the high pass repair image data.

**18**. The method of claim **17**, wherein

the step of performing a frequency transform to the high pass filtered sample image data generates at least magnitudes of the fast fourier transform thereof;

the step of performing the frequency transform to the high pass filtered repair image data generates a phase and magnitudes of the fast fourier transform thereof; and

the step of performing an inverse transform of the frequency transform generates the new high pass filtered repair image data using a phase of the fast fourier transform data of the high pass filtered repair image data and one of the magnitudes of the fast fourier transform data of the high pass filtered sample image data and the magnitudes of the fast fourier transform data of the high pass filtered repair image data.

**19**. The method of claim **18**, further comprising the step of:

comparing the magnitudes of the fast fourier transform data of the sample image data with magnitudes and minimum magnitudes of the fast fourier transform data of the repair image data,

wherein the step of performing an inverse transform generates the new image data using a selected one of the minimum magnitudes and the phase of the fast fourier transform data of the repair image data.

**20**. The method of claim **19**, wherein

a magnitude of a DC component is selected as the magnitude of the fast fourier transform data of the repair image data.

**21**. The method of claim **13**, further comprising the step of:

conforming the new high pass filtered repair image data to a predetermined value.

**22**. The method of claim **13**, wherein

the noise mask is binary data such that such that it is a value of 1 wherever there is no noise and a value of 0 wherever there is noise.

**23**. The method of claim **14**, wherein

the soft noise mask is soft edged data such that it is a value of 0 wherever there is noise, a value of between 0 and 1 near the edge of the noise and a value of 1 at at least a certain distance from the edge of the noise.

**24**. The method of claim **23**, wherein

the value of the noise mask outside a noise area defined by $1-\exp(-k \times d \times d)$, where k is a positive constant, and k is set to a large value where the noise mask is to have a broad soft edge, and k is set to a small value where the noise mask is to have a narrow soft edge, and where d is a distance from the edge of the noise.

**25**. The method of claim **13**, wherein

the steps of filtering the repair image data to generate low pass filtered repair image data and high pass filtered repair image data, performing the frequency transform to the high pass filtered repair image data to generate frequency transformed data of the high pass filtered repair image data, and performing an inverse transform of the frequency transform using the frequency transformed data of the high pass filtered sample image data and the frequency transformed data of the high pass filtered repair image data to generate new high pass filtered repair image data are performed recursively to generate the new image data.

**26**. An apparatus for removing noise from image data, comprising:

means for defining an area of noise on the image data;

means for generating a noise mask to distinguish pixels inside the defined area of noise on the image data from pixels outside the area of noise on the image data;

means for defining repair image data including the defined area of noise;

means for defining sample image data which is similar to the repair image data;

means for creating from the noise mask a soft noise mask having a soft edge;

means for performing a frequency transform to the sample image data and to generate frequency transformed data of the sample image data;

means for performing the frequency transform to the repair image data to generate frequency transformed data of the repair image data;

means for performing an inverse transform of the frequency transformed data of the sample image data and the frequency transformed data of the repair image data to generate new repair image data; and