Claims

[Claim 1] An image sensor for an optical device, said image sensor comprising:
a planar photo-sensitive surface comprising a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement for converting an image incident thereon into an electrical or electronic signal or signals.

[Claim 2] The image sensor of claim 1, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface as a series of concentric circles.

[Claim 3] The image sensor of claim 1, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface in said generally circular arrangement comprising at least one spiral line of photo sensors or pixels.

[Claim 4] The image sensor of claim 3, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface in said generally circular arrangement comprising two or more interlaced spiral lines of photo sensors or pixels.

[Claim 5] The image sensor of any one of claims 1 to 4, wherein said image sensor comprises means for capturing a very wide angle image and directing it towards said planar photo-sensitive surface to be incident on said plurality of photo sensors or pixels.

[Claim 6] The image sensor of claim 5, wherein the means for capturing a very wide angle image is arranged to capture a substantially panoramic image surrounding the image senor.

[Claim 7] The image sensor of claim 6, wherein the substantially panoramic image is not a full panoramic image, but comprises a 360 degree doughnut shaped image view in a selected plane about the image sensor.

[Claim 8] The image sensor of claim 6, wherein the substantially panoramic image is a full panoramic image comprising a generally hemispherical image view about the image capturing means.

[Claim 9] The image sensor of any one of claims 1 to 8, wherein said image sensor further comprises:
means for converting said electronic or electrical signal or signals into digital image data.

[Claim 10] The image sensor of any one of claims 1 to 9, wherein said plurality of photo sensors or pixels are addressable such that a window portion of a

captured image can be defined by reference to addresses of respective photo sensors or pixels.

[Claim 11] The image sensor of any one of claims 1 to 10, wherein said optical device comprises a camera or a projector.

[Claim 12] A method of capturing a very wide angle image using an image sensor for an optical device, said method comprising:
directing a very wide angle image onto a photo-sensitive surface of said image sensor, said image sensor comprising a planar photo-sensitive surface having a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement.

[Claim 13] A method of manufacturing an image sensor for an optical device, said method comprising:
providing an image sensor with a planar photo-sensitive surface having a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement.

[Claim 14] An image sensor for an optical device, said image sensor comprising:
a photo-sensitive surface comprising a plurality of photo sensors or pixels positioned on said photo-sensitive surface for converting a very wide angle image or a portion thereof incident thereon into electrical or electronic signal or signals convertible to image data representative of said very wide angle image or said portion thereof, the arrangement being such that the photo sensors or pixels are each orientated on said photo-sensitive surface in a direction generally coincident with a respective part of said very wide angle image incident thereon.

[Claim 15] A method of capturing a very wide angle image using an image sensor for an optical device, said method comprising:
directing a very wide angle image onto a photo-sensitive surface of said image sensor, said image sensor comprising a photo-sensitive surface having a plurality of photo sensors or pixels positioned on said photo-sensitive surface for converting said very wide angle image or a portion thereof incident thereon into electrical or electronic signal or signals convertible to image data representative of said very wide angle image or said portion thereof, the arrangement being such that the photo sensors or pixels are each orientated on said photo-sensitive surface in a direction generally coincident with a respective part of said very wide angle image incident thereon.

[Claim 16] A system for capturing and recording a very wide angle image, comprising:

means for capturing a very wide angle image and directing it towards a planar photo-sensitive surface of an image sensor, said planar photo-sensitive surface comprising a plurality of photo sensors or pixels, said image sensor converting said very wide angle image into an electrical or electronic signal or signals;
means for converting said electrical or electronic signal or signals into digital image data;
means for buffering or storing said digital image data;
means for receiving a selection of a window portion of said very wide angle image; and
means for retrieving digital image data comprising said selected window portion of said very wide angle image from said buffer or storage means and transmitting said retrieved digital image data to an information processing means.

[Claim 17] The system of claim 16, wherein the image sensor comprises the image sensor of claim 1.

[Claim 18] A method of capturing and recording a very wide angle image, comprising the steps of:
capturing a very wide angle image and directing it towards a planar photo-sensitive surface of an image sensor, said planar photosensitive surface comprising a plurality of photo sensors or pixels;
converting said captured very wide angle image into an electrical or electronic signal or signals;
converting said electrical or electronic signal or signals into digital image data;
buffering or storing said digital image data;
receiving a selection of a window portion of said very wide angle image;
retrieving digital image data comprising said selected window portion of said very wide angle image from said buffer or storage means; and
transmitting said retrieved digital image data to an information processing means.

[Claim 19] A system for projecting a very wide angle image onto a viewing surface, comprising:
means for receiving very wide angle image data;
means for converting said very wide angle image data to an optical image and for directing said optical image or a portion of said optical image towards an image projection means;

a viewing surface mounted in proximity to said image projection means;

wherein said image projection means projects said optical image or a portion of said optical image onto said viewing surface; and wherein said means for converting said very wide angle image data to said optical image comprises a plurality of photo sensors or pixels for converting received image data into said optical image, said plurality of photo sensors or pixels being arranged in a generally circular arrangement.

[Claim 20] A method of projecting a very wide angle image onto a viewing surface, comprising:

receiving very wide angle image data;

converting said very wide angle image data to an optical image using a plurality of photo sensors or pixels for converting received image data into said optical image, said plurality of photo sensors or pixels being arranged in a generally circular arrangement;

directing said optical image or a portion of said optical image towards an image projection means; and

projecting said optical image or a portion of said optical image onto a viewing surface mounted in proximity to said image projection means.

[Claim 21] A heads-up display in a headgear worn by a user, comprising:

a viewing surface comprising a visor of the headgear; and

a projector comprising the system of claim 19 for projecting an optical image or a portion of said optical image onto said viewing surface of said visor.

[Claim 22] A conference call system wherein at least one participant conference station includes a projector comprising the system of claim 19.

Claims.

1. An image sensor system for an optical device, said image sensor system comprising:

an image sensor having a planar photo-sensitive surface comprising a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement for converting an image incident thereon into an electrical or electronic signal or signals, wherein said plurality of photo sensors or pixels are addressable or identifiable;

a display screen for displaying an incident image or a plan of the incident image or a representative image of the incident image with a window frame overlying said displayed incident image, plan or representative image, wherein said window frame is movable over the displayed incident image, plan or representative image to enable selection of a desired window portion of the incident image; and

a processor for translating a selected window portion into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image.

2. The image sensor system of claim 1, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface as a series of concentric circles.

3. The image sensor system of claim 1, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface in said generally circular arrangement comprising at least one spiral line of photo sensors or pixels.

4. The image sensor system of claim 3, wherein the plurality of photo sensors or pixels is arranged on said planar photo-sensitive surface in said generally circular arrangement comprising two or more interlaced spiral lines of photo sensors or pixels.

5. The image sensor system of any one of claims 1 to 4, wherein said image sensor comprises means for capturing a very wide angle image and directing it towards said planar photo-sensitive surface to be incident on said plurality of photo sensors or pixels.

6. The image sensor system of claim 5, wherein the means for capturing a very wide angle image is arranged to capture a substantially panoramic image surrounding the image senor.

7. The image sensor system of claim 6, wherein the substantially panoramic image is not a full panoramic image, but comprises a 360 degree doughnut shaped image view in a selected plane about the image sensor.

8. The image sensor system of claim 6, wherein the substantially panoramic image is a full panoramic image comprising a generally hemispherical image view about the image capturing means.

9. The image sensor system of any one of claims 1 to 8, wherein said image sensor further comprises:

means for converting said electronic or electrical signal or signals into digital image data.

10. The image sensor system of any one of claims 1 to 9, wherein said optical device comprises a camera or a projector.

11. A method of capturing a very wide angle image using an image sensor for an optical device, said method comprising:

directing a very wide angle image to be incident on a photo-sensitive surface of said image sensor, said image sensor comprising a planar photo-sensitive surface having a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement, said plurality of photo sensors or pixels being addressable or identifiable;

displaying an incident image or a plan of the incident image or a representative image of the incident image on a display screen with a window frame overlying said displayed incident image, plan or representative image, said window frame being movable over the displayed incident image, plan or representative image to enable selection of a desired window portion of the incident image; and

translating a selected window portion into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image.

12. A method of manufacturing an image sensor system for an optical device, said method comprising:

providing an image sensor with a planar photo-sensitive surface having a plurality of photo sensors or pixels positioned on said planar photo-sensitive surface in a generally circular arrangement, wherein said plurality of photo sensors or pixels are addressable or identifiable;

providing a display screen for displaying an image incident on the sensor or a plan of the incident image or a representative image of the incident image with a window frame overlying said displayed incident image, plan or representative image, wherein said window frame is movable over the displayed incident image, plan or representative image to enable selection of a desired window portion of the incident image; and

providing a processor for translating a selected window portion into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image.

13. An image sensor system for an optical device, said image sensor comprising:

a photo-sensitive surface comprising a plurality of photo sensors or pixels positioned on said photo-sensitive surface for converting a very wide angle image or a portion thereof incident thereon into electrical or electronic signal or signals convertible to image data representative of said very wide angle image or said portion thereof, the arrangement being such that the photo sensors or pixels are each orientated on said photo-sensitive surface in a direction generally coincident with a respective part of said very wide angle image incident thereon, wherein said plurality of photo sensors or pixels are addressable or identifiable;

a display screen for displaying an incident image or a plan of the incident image or a representative image of the incident image with a window frame overlying said

displayed incident image, plan or representative image, wherein said window frame is movable over the displayed incident image, plan or representative image to enable selection of a desired window portion of the incident image; and

a processor for translating a selected window portion into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image.

14. A method of capturing a very wide angle image using an image sensor for an optical device, said method comprising:

directing a very wide angle image to be incident on a photo-sensitive surface of said image sensor, said image sensor comprising a photo-sensitive surface having a plurality of photo sensors or pixels positioned on said photo-sensitive surface for converting said very wide angle image or a portion thereof incident thereon into electrical or electronic signal or signals convertible to image data representative of said very wide angle image or said portion thereof, the arrangement being such that the photo sensors or pixels are each orientated on said photo-sensitive surface in a direction generally coincident with a respective part of said very wide angle image incident thereon, wherein said plurality of photo sensors or pixels are addressable or identifiable;

displaying an incident image or a plan of the incident image or a representative image of the incident image on a display screen with a window frame overlying said displayed incident image, plan or representative image, said window frame being movable over the displayed incident image, plan or representative image to enable selection of a desired window portion of the incident image; and

translating a selected window portion into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image.

15. A system for capturing and recording a very wide angle image, comprising:

means for capturing a very wide angle image and directing it towards a planar photo-sensitive surface of an image sensor, said planar photosensitive surface comprising a plurality of photo sensors or pixels, said plurality of photo sensors or

pixels being addressable, said image sensor converting said very wide angle image incident thereon into an electrical or electronic signal or signals;

means for converting said electrical or electronic signal or signals into digital image data;

means for buffering or storing said digital image data;

means for displaying an incident image or a plan of the incident image or a representative image of the incident image;

means for receiving a selection of a window portion of said very wide angle image through a movable window frame overlying said displayed incident image;

means for translating a selected window portion of the incident image into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image; and

means for retrieving digital image data comprising said selected window portion of said very wide angle image from said buffer or storage means by reference to addresses or identifiers of respective photo sensors or pixels and transmitting said retrieved digital image data to an information processing means.

16. The system of claim 15, wherein the image sensor comprises the image sensor of claim 1.

17. A method of capturing and recording a very wide angle image, comprising the steps of:

capturing a very wide angle image and directing it towards a planar photo-sensitive surface of an image sensor, said planar photosensitive surface comprising a plurality of photo sensors or pixels, said plurality of photo sensors or pixels being addressable;

converting said captured very wide angle image into an electrical or electronic signal or signals;

converting said electrical or electronic signal or signals into digital image data;

buffering or storing said digital image data;

displaying an image incident on said sensor or a plan of the incident image or a representative image of the incident image;

receiving a selection of a window portion of said very wide angle image through a movable window frame overlying said displayed incident image;

translating a selected window portion of the incident image into addresses or identifiers for appropriate individual or blocks of photo sensors or pixels in order to determine digital image data to be retrieved from a memory in response to a selected window portion of the incident image;

retrieving digital image data comprising said selected window portion of said very wide angle image from said buffer or storage means by reference to addresses or identifiers of respective photo sensors or pixels; and

transmitting said retrieved digital image data to an information processing means.