CLAIMS:

1. A powered ophthalmic lens, the powered ophthalmic lens comprising:

a contact lens including an optic zone and a peripheral zone; and

an eye gaze tracking system incorporated into the peripheral zone of the contact lens, the eye gaze tracking system including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises at least one photo-detector positioned to capture an image of the eye and the at least one photodetector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast to track eye movement.

2. The powered ophthalmic lens according to Claim 1, wherein the sensor comprises at least one accelerometer to track movement of at least one of the eye or the contact lens.

3. The powered ophthalmic lens according to Claim 1, wherein the sensor comprises at least one neuromuscular sensor configured to detect neuromuscular activity associated with eye movement.

4. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system further comprises a signal processor configured to receive signals from the sensor, perform digital signal processing, and output one or more to the system controller.

5. The powered ophthalmic lens according to Claim 4, wherein signal processor comprises associated memory.

6. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system further comprises a power supply.

7. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system further comprises a communication system for communication with at least a second contact lens.

8. The powered ophthalmic lens according to Claim 1, wherein the spatial coordinates are in two dimensions.

9. The powered ophthalmic lens according to Claim 1, wherein the spatial coordinates are in three dimensions.

10. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system wirelessly interfaces with an external device.

11. A powered ophthalmic lens, the powered ophthalmic lens comprising:

a contact lens; and

an eye gaze tracking system incorporated into the contact lens, the eye gaze tracking system including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises at least one photodetector positioned to capture an image of the eye and the at least one photo- detector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast to track eye movement.

12. The powered ophthalmic lens according to Claim 11, wherein the sensor comprises at least one accelerometer to track movement of at least one of the eye or the contact lens.

13. The powered ophthalmic lens according to Claim 11, wherein the sensor comprises at least one neuromuscular sensor configured to detect neuromuscular activity associated with eye movement.

14. The powered ophthalmic lens according to Claim 11, wherein the eye gaze tracking system further comprises a signal processor configured to receive signals from the sensor, perform digital signal processing, and output one or more to the system controller.

15. The powered ophthalmic lens according to Claim 14, wherein signal processor comprises associated memory.

16. The powered ophthalmic lens according to Claim 11, wherein the eye gaze tracking system further comprises a power supply.

17. The powered ophthalmic lens according to Claim 11, wherein the eye gaze tracking system further comprises a communication system for communication with at least a second contact lens.

18. The powered ophthalmic lens according to Claim 11, wherein the spatial coordinates are in two dimensions.

19. The powered ophthalmic lens according to Claim 11 wherein the spatial coordinates are in three dimensions.

20. The powered ophthalmic lens according to Claim 11, wherein the eye gaze

tracking system wirelessly interfaces with an external device.

21. A powered ophthalmic lens, the powered ophthalmic lens comprising:

an intraocular lens; and

an eye gaze tracking system incorporated into the intraocular lens, the eye gaze tracking system including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises at least one photodetector positioned to capture an image of the eye and the at least one photodetector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast to track eye movement.

CLAIMS:

1. A powered ophthalmic lens, the powered ophthalmic lens comprising:

a contact lens including an optic zone and a peripheral zone; and

an eye gaze tracking system incorporated into the peripheral zone of the contact lens, the eye gaze tracking system including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises:

a) at least one accelerometer to track movement of at least one of the eye or the contact lens; or at least one neuromuscular sensor configured to detect neuromuscular activity associated with eye movement;

b) at least one photo-detector positioned to capture an image of the eye and the at least one photodetector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast of an eye to track eye movement; and

c) wherein the eye gaze tracking system further comprises a signal processor configured to receive signals from the sensor, perform digital signal processing, and output one or more to the system controller.

2. The powered ophthalmic lens according to Claim 1, wherein signal processor

comprises associated memory.

3. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system further comprises a power supply.

4. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system further comprises a communication system for communication with at least a second contact lens.

5. The powered ophthalmic lens according to Claim 1, wherein the spatial coordinates are in two dimensions.

6. The powered ophthalmic lens according to Claim 1, wherein the spatial coordinates are in three dimensions.

7. The powered ophthalmic lens according to Claim 1, wherein the eye gaze tracking system wirelessly interfaces with an external device.

8. A powered ophthalmic lens, the powered ophthalmic lens comprising:

a contact lens; and

an eye gaze tracking system incorporated into the contact lens, the eye gaze tracking system

including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises:

a) at least one accelerometer to track movement of at least one of the eye or the contact lens; or at least one neuromuscular sensor configured to detect neuromuscular activity associated with eye movement;

b) at least one photo-detector positioned to capture an image of the eye and the at least one photodetector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast of an eye to track eye movement; and

c) wherein the eye gaze tracking system further comprises a signal processor configured to receive signals from the sensor, perform digital signal processing, and output one or more to the system controller.

9. The powered ophthalmic lens according to Claim 8, wherein signal processor comprises associated memory.

10. The powered ophthalmic lens according to Claim 8, wherein the eye gaze tracking system further comprises a power supply.

11. The powered ophthalmic lens according to Claim 8, wherein the eye gaze tracking system further comprises a communication system for communication with at least a second contact lens.

12. The powered ophthalmic lens according to Claim 8, wherein the spatial coordinates are in two dimensions.

13. The powered ophthalmic lens according to Claim 8, wherein the spatial coordinates are in three dimensions.

14. The powered ophthalmic lens according to Claim 8, wherein the eye gaze tracking system wirelessly interfaces with an external device.

15. A powered ophthalmic lens, the powered ophthalmic lens comprising:

an intraocular lens; and

an eye gaze tracking system incorporated into the intraocular lens, the eye gaze tracking system including a sensor to determine and track eye position, a system controller cooperatively associated with the sensor, the system controller configured to determine and track gaze direction in spatial coordinates based on information from the sensor output a control signal, and at least one actuator configured to receive the output control signal and implement a predetermined function, wherein the sensor comprises:

a) at least one accelerometer to track movement of at least one of the eye or the contact lens; or at least one neuromuscular sensor configured to detect neuromuscular activity associated with eye movement;

b) at least one photo-detector positioned to capture an image of the eye and the at least one photodetector comprises a rear-facing camera configured to detect changes in images, patterns, or contrast of an eye to track eye movement; and

c) wherein the eye gaze tracking system further comprises a signal processor configured to receive signals from the sensor, perform digital signal processing, and output one or more to the system controller.