

CLAIMS

1. A method executed by at least one processor of a computing system, the method comprising:
 - 5 receiving retinal signal data corresponding to an individual;
 - determining that there are one or more artifacts in the retinal signal data by determining that an impedance of a circuit that collected the retinal signal data has surpassed a threshold impedance of the circuit;
 - modifying the retinal signal data to compensate for the artifacts; and
 - 10 storing the retinal signal data.
2. The method of claim 1, wherein modifying the retinal signal data to compensate for the artifacts comprises removing at least a portion of the retinal signal data corresponding to the artifacts.
- 15 3. The method of any one of claims 1–2, further comprising:
 - receiving calibration data corresponding to the individual; and
 - determining, based on the calibration data, the threshold impedance of the circuit.
- 20 4. The method of any one of claims 1–3, wherein the retinal signal data is responsive to at least one flash of light from a light stimulator, wherein the calibration data is collected prior to the at least one flash of light by the same circuit that collected the retinal signal data, and wherein the method further comprises causing the light stimulator to generate the at least one flash of light.
- 25 5. The method of any one of claims 1–4, wherein the retinal signal data has a sampling frequency between 4 to 24 kHz.
6. The method of any one of claims 1–5, wherein the retinal signal data is collected for a signal collection time of 200 milliseconds to 500 milliseconds.

7. The method of any one of claims 1–6, wherein the one or more artifacts comprise distortions in the retinal signal data.
8. The method of any one of claims 1–7, wherein the one or more artifacts were caused by one or more of: capture of electrical signals not originating from the retina, shift in electrode positioning, change in ground or reference electrode contact, photomyoclonic reflex, eye lid blinks, and ocular movements.
9. The method of any one of claims 1–8, further comprising:
10 extracting, from the retinal signal data, one or more retinal signal features;
extracting, from the retinal signal features, one or more descriptors;
applying the one or more descriptors to a first mathematical model and a second mathematical model, wherein the first mathematical model corresponds to a first condition and the second mathematical model corresponds to a second condition, thereby generating a first predicted
15 probability for the first condition and a second predicted probability for the second condition; and
outputting the first predicted probability and the second predicted probability.
10. A method executed by at least one processor of a computing system, the method comprising:
20 receiving retinal signal data corresponding to an individual;
determining that there are one or more artifacts in the retinal signal data by determining that an impedance of a circuit that collected the retinal signal data has surpassed a threshold impedance of the circuit;
storing an indication in the retinal signal data of time periods corresponding to the one or
25 more artifacts; and
storing the retinal signal data.
11. The method of claim 10, further comprising:
receiving calibration data corresponding to the individual; and
30 determining, based on the calibration data, the threshold impedance of the circuit.

12. The method of any one of claims 10–11, further comprising determining the time periods corresponding to the one or more artifacts by determining the time periods that an impedance of the retinal signal data surpasses the threshold impedance.
- 5 13. The method of any one of claims 10–12, wherein the retinal signal data is responsive to at least one flash of light from a light stimulator, wherein the calibration data is collected prior to the at least one flash of light, and wherein the method further comprises causing the light stimulator to generate the at least one flash of light.
- 10 14. The method of any one of claims 10–13, wherein the retinal signal data has a sampling frequency between 4 to 24 kHz.
- 15 15. The method of any one of claims 10–14, wherein the retinal signal data is collected for a signal collection time of 200 milliseconds to 500 milliseconds.
16. The method of any one of claims 10–15, wherein the one or more artifacts comprise distortions in the retinal signal data.
17. The method of any one of claims 10–16, wherein the one or more artifacts were caused by
20 one or more of: capture of electrical signals not originating from the retina, shift in electrode positioning, change in ground or reference electrode contact, photomyoclonic reflex, eye lid blinks, and ocular movements.
18. The method of any one of claims 10–17, further comprising:
25 extracting, from the retinal signal data, one or more retinal signal features;
extracting, from the retinal signal features, one or more descriptors;
applying the one or more descriptors to a first mathematical model and a second mathematical model, wherein the first mathematical model corresponds to a first condition and the second mathematical model corresponds to a second condition, thereby generating a first predicted
30 probability for the first condition and a second predicted probability for the second condition; and
outputting the first predicted probability and the second predicted probability.

19. A method executed by at least one processor of a computing system, the method
5 comprising:
- recording a first set of retinal signal data corresponding to an individual;
 - determining that there are one or more artifacts in the first set of retinal signal data by
determining that an impedance of a circuit that collected the first set of retinal signal data has
surpassed a first threshold impedance of the circuit;
 - 10 recording a second set of retinal signal data corresponding to the individual;
 - determining that the impedance of the circuit while recording the second set of retinal signal
data has not surpassed a second threshold impedance of the circuit; and
 - storing the second set of retinal signal data.
- 15 20. The method of claim 19, further comprising:
- recording a first set of calibration data corresponding to the individual before recording the
first set of retinal signal data;
 - determining, based on the first set of calibration data, the first threshold impedance of the
circuit;
 - 20 recording a second set of calibration data corresponding to the individual before recording
the second set of retinal signal data; and
 - determining, based on the second set of calibration data, the second threshold impedance
of the circuit.
- 25 21. The method of claim 20, further comprising:
- after recording the first set of calibration data, triggering a light stimulator to generate a
first flash of light based on a set of flash parameters, wherein the first set of retinal signal data is
responsive to the first flash of light; and
 - after recording the second set of calibration data, triggering the light stimulator to generate
30 a second flash of light based on the set of flash parameters, wherein the second set of retinal signal
data is responsive to the second flash of light.

22. The method of any one of claims 19–21, wherein the first set of retinal signal data and the second set of retinal signal data have a sampling frequency between 4 to 24 kHz.
- 5 23. The method of any one of claims 19–22, wherein the first set of retinal signal data and the second set of retinal signal data are collected for a signal collection time of 200 milliseconds to 500 milliseconds.
24. The method of any one of claims 19–23, further comprising:
- 10 extracting, from the second set of retinal signal data, one or more retinal signal features;
extracting, from the retinal signal features, one or more descriptors;
applying the one or more descriptors to a first mathematical model and a second mathematical model, wherein the first mathematical model corresponds to a first condition and the second mathematical model corresponds to a second condition, thereby generating a first predicted
15 probability for the first condition and a second predicted probability for the second condition; and
outputting the first predicted probability and the second predicted probability.
25. A method executed by at least one processor of a computing system, the method comprising:
- 20 receiving retinal signal data corresponding to an individual;
inputting the retinal signal data to a machine learning algorithm (MLA), wherein the MLA was trained using labeled retinal signal data, and wherein each set of retinal signal data in the labeled retinal signal data comprises a label indicating whether the respective set of retinal signal data comprises any artifacts;
- 25 outputting, by the MLA, adjusted retinal signal data; and
storing the adjusted retinal signal data.
26. The method of claim 25, wherein the retinal signal data has a sampling frequency between 4 to 24 kHz.

27. The method of any one of claims 25–26, wherein the retinal signal data is collected for a signal collection time of 200 milliseconds to 500 milliseconds.
28. The method of any one of claims 25–27, wherein the MLA removes portions of the retinal signal data corresponding to artifacts.
29. The method of any one of claims 25–28, wherein the MLA adds indicators to the retinal signal data that indicate which portions of the retinal signal data comprise artifacts.
30. A system comprising at least one processor and memory storing a plurality of executable instructions which, when executed by the at least one processor, cause the system to perform the method of any one of claims 1–29.
31. The system of claim 30, further comprising the light stimulator.
32. The system of claim 30 or claim 31, further comprising one or more sensors for collecting the retinal signal data.
33. A non-transitory computer-readable medium containing instructions which, when executed by a processor, cause the processor to perform the method of any one of claims 1–29.