WHAT IS CLAIMED IS:

1. A vehicle for inspecting a rail, the vehicle comprising:

rail inspection sensors configured for capturing transducer data describing the rail; and

a processor configured for:

receiving the transducer data; and

processing the captured transducer data to determine whether the captured transducer data identifies a suspected rail flaw, the processing comprising:

inputting the captured transducer data as a stream of overlapping sequences in a form suitable for a machine learning system that has been trained to identify patterns in the transducer data that indicate rail flaws, the machine learning system comprising a deep learning convolutional neural network to perform image pattern recognition that is combined with a long short-term memory recurrent neural network to identify rail flaws of the rail of indeterminate length;

receiving an output from the machine learning system, the output indicating whether the captured transducer data identifies the suspected rail flaw;

auditing at least one of the deep learning convolutional neural network or the long short-term memory recurrent neural network to identify at least one of a false positive or a false negative, the auditing comparing the output from the machine learning system to output from a human analyst; and

adjusting the at least one of the deep learning convolutional neural network on the long short-term memory recurrent neural network based on the at least one of the false positive or the false negative; and

transmitting an alert to an operator of the vehicle based at least in part on the output indicating that the captured transducer data identifies the suspected rail flaw,

the alert including a location of the suspected rail flaw and instructing the operator to stop the vehicle and to perform a repair action,

wherein the stream of overlapping sequences comprises a sequence of overlapping 2-dimesional images.

2. The vehicle of claim 1, further comprising a camera for capturing a camera image of the location, wherein the alert includes the camera image.

3. The vehicle of claim 1, wherein the output is transmitted, via a network, to a remote storage device or a remote processor.

4. The vehicle of claim 1, rail inspection sensors include one or more of an ultrasonic transducer, an induction transducer, and an eddy current transducer.

5. A method for inspecting a rail, the method comprising:

receiving transducer data from rail inspection sensors mounted on a vehicle that is located on the rail; and

processing the transducer data to identify locations of suspected rail flaws in the rail, the processing comprising:

inputting the transducer data as a stream of overlapping sequences in a form suitable for a machine learning system that has been trained to identify patterns in the transducer data that indicate rail flaws, the machine learning system comprising a deep learning convolutional neural network to perform image pattern recognition that is combined with a long short-term memory recurrent neural network to identify rail flaws of the rail of indeterminate length;

receiving an output from the machine learning system, the output including a list of suspected rail flaws and their corresponding locations on the rail;

auditing at least one of the deep learning convolutional neural network or the long short-term memory recurrent neural network to identify at least one of a false positive or

a false negative, the auditing comparing the output from the machine learning system to output from a human analyst; and

adjusting the at least one of the deep learning convolutional neural network on the long short-term memory recurrent neural network based on the at least one of the false positive or the false negative; and

initiating a repair action based on the list of suspected rail flaws.

6. The method of claim 5, wherein the transducer data includes images.

7. A method for inspecting a rail, the method comprising:

receiving transducer data from rail inspection sensors mounted on a vehicle that is located on the rail;

processing the transducer data to identify locations of suspected rail flaws in the rail, the processing comprising:

inputting the transducer data in a form suitable for a machine learning system, that has been trained to identify patterns in the transducer data that indicate rail flaws; and

receiving an output from the machine learning system, the output including a list of suspected rail flaws and their corresponding locations on the rail; and

initiating a repair action based on the list of suspected rail flaws,

wherein the transducer data includes images; and

wherein the inputting the transducer data includes streaming overlapped images.

8. The method of claim 5, wherein the transducers include ultrasonic transducers.

9. The method of claim 5, wherein the transducers include induction transducers.

10. The method of claim 5, wherein the transducers include eddy current transducers.

11. The method of claim 5, wherein the receiving is from a requestor via a network and the method further comprises sending the list of suspected rail flaws to the requestor.

12. The method of claim 5, wherein the processing and the initiating are performed by a processor located on the vehicle.

13. The method of claim 5, further comprising, performing the repair action, the repair action comprising performing a verification of one of the suspected rail flaws using a hand held sensor.

14. A system for inspecting a rail, the system comprising:

a non-transitory memory having computer readable instructions; and

one or more processors for executing the computer readable instructions, the computer readable instructions controlling the one or more processors to perform operations comprising:

receiving transducer data from rail inspection sensors mounted on a vehicle that is located on the rail;

processing the transducer data to identify locations of suspected rail flaws in the rail, the processing comprising:

inputting the transducer data as a stream of overlapping sequences in a form suitable for a machine learning system that has been trained to identify patterns in the transducer data that indicate rail flaws, the machine learning system comprising a deep learning convolutional neural network to perform image pattern recognition that is combined with a long short-term memory recurrent neural network to identify rail flaws of the rail of indeterminate length;

receiving an output from the machine learning system, the output including a list of suspected rail flaws and their corresponding locations on the rail;

auditing at least one of the deep learning convolutional neural network or the long short-term memory recurrent neural network to identify at least one of a false positive or a false negative, the auditing comparing the output from the machine learning system to output from a human analyst; and

adjusting the at least one of the deep learning convolutional neural network on the long short-term memory recurrent neural network based on the at least one of the false positive or the false negative; and

initiating a repair action based on the list of suspected rail flaws.

15. A computer program product for inspecting a rail, the computer program product comprising a non-transitory computer readable storage medium having program instructions embodied therewith, the program instructions executable by a processor to cause the processor to perform operations comprising:

receiving transducer data from rail inspection sensors mounted on a vehicle that is located on the rail; and

processing the transducer data to identify locations of suspected rail flaws in the rail, the processing comprising:

inputting the transducer data as a stream of overlapping sequences in a form suitable for a machine learning system, that has been trained to identify patterns in the transducer data that indicate rail flaws, the machine learning system comprising a deep learning convolutional neural network to perform image pattern recognition that is combined with a long short-term memory recurrent neural network to identify rail flaws of the rail of indeterminate length; and

receiving an output from the machine learning system, the output including a list of suspected rail flaws and their corresponding locations on the rail;

auditing at least one of the deep learning convolutional neural network or the long short-term memory recurrent neural network to identify at least one of a false positive or a false negative, the auditing comparing the output from the machine learning system to output from a human analyst;

adjusting the at least one of the deep learning convolutional neural network on the long short-term memory recurrent neural network based on the at least one of the false positive or the false negative; and

initiating a repair action based on the list of suspected rail flaws.

16. The vehicle of claim 1, wherein the processing further comprises:

generating a flaw suspect list table comprising:

a test segment indicator that indicates a data acquisition recording run on the rail of the suspected rail flaw;

a rail identifier that identifies whether the suspected rail flaw is in a left rail or a right rail;

a rail pulse count indicator that indicates a distance along the rail from a start of a recording;

a code identifier that identifies a code corresponding to a type of the suspected flaw; and

a confidence identifier that indicates a level of confidence of the machine learning system.

17. The vehicle of claim 1, wherein at least one of the deep learning convolutional neural network or the long short-term memory recurrent neural network is trained by comparing a predicted label associated with a training image to a known label associated with the training image, and wherein the processing is performed in a cloud computing environment.

18. The vehicle of claim 1, wherein the overlapping 2-dimesional images overlap by a predetermined number of pixels.

19. The vehicle of claim 18, wherein the predetermined number of pixels is greater than half the width of the overlapping 2-dimensional images.

20. The vehicle of claim 1, wherein the overlapping 2-dimensional images overlap in all but four-pixel increments.