Deep learning sound applications could help spot industrial trouble spots

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(Tech Xplore)—An Israeli startup company called 3DSignals is developing deep learning sound applications that could soon be used in production environments to identify trouble spots before they develop into bigger problems. The company has outlined its current technology and its hope for the future in recent conversations with the press.

Any car passenger knows when they hear something that is not right—when the motor sounds funny, belts are strained, or the brakes squeal. But only those with special training can accurately identify the source of the problem. 3DSignals is hoping to change that by applying neural networks developed for images or video to the sounds of everyday systems. They hope that such systems will be able to identify odd car noises and offer helpful advice regarding causes and solutions. But that sort of system is still in the future—for now, the company is focusing on industrial applications, such as systems to identify machinery that is about to break down.

Most machines, reps for the company note, experience some degree of degradation before failures occur. Such degradations quite often result in changes in sound waves generated by machinery—a massive saw, for example, might emit a high-pitched whir, beyond human hearing, when its blade starts to dull in the minutes, hours or even days before it ultimately fails. If a computerized system could alert operators to imminent failure, the blade could be changed immediately—a far less time-consuming procedure than dealing with a total breakdown.

To create such a system, the researchers have turned to deep-learning systems, which are based on neural networks. A system could be taught what a machine is supposed to sound like and then monitor it, waiting for a deviation to occur, whereupon it would signal an operator. The team at 3DSignals report that they have created such a system and are already working to improve it—they want the system not only to notice when something is wrong, but to identify the problem based on the sounds it is making. This will, of course, require the assistance of human machine operators—the system could be trained via repeated diagnoses by human operators. Over time, the deep learning system would be able to identify unique problems based only on the emitted sounds, saving manufacturers time and money.

More information: www.3dsig.com/