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Rail Vision

AI's Role in Improving Rail Safety and Maintenance

Rail Vision is revolutionising railway safety and maintenance. Using the latest artificial intelligence (AI), deep learning and sensor technology, this Israel-based technology provider has developed state-of-the-art solutions that lower the risk of accident, unplanned downtime and maintenance costs through advanced obstacle classification technology.

Bursting into the market in 2016, **Rail Vision** has launched advanced safety systems developed specifically for mainline, shunting yard and light rail environments. These can be engineered to provide a system that meets each customer's specific needs.

Created by Leading Technologists

Rail Vision's CEO Shahar Hania has been with the company from the

start. With experience working in optical engineering, systems engineering, electro-optics and deep learning technologies across the communication, defence and train industries, he started Rail Vision as a passion project with his three fellow co-founders.

Their evenings and weekends were spent developing a rail-specific obstacle detection and classification system, while also approaching potential investors. Interest in the technology was high, and it wasn't long before they had the financing they needed and became the first company to bring such a solution to the industry.

AI Unlocks New Capabilities and Benefits

Hania first took on the role of Head of Technology Research and Development (R&D), only later stepping into the position of CEO. His focus was on optimising Rail Vision's technology, and it was his decision to embrace AI.



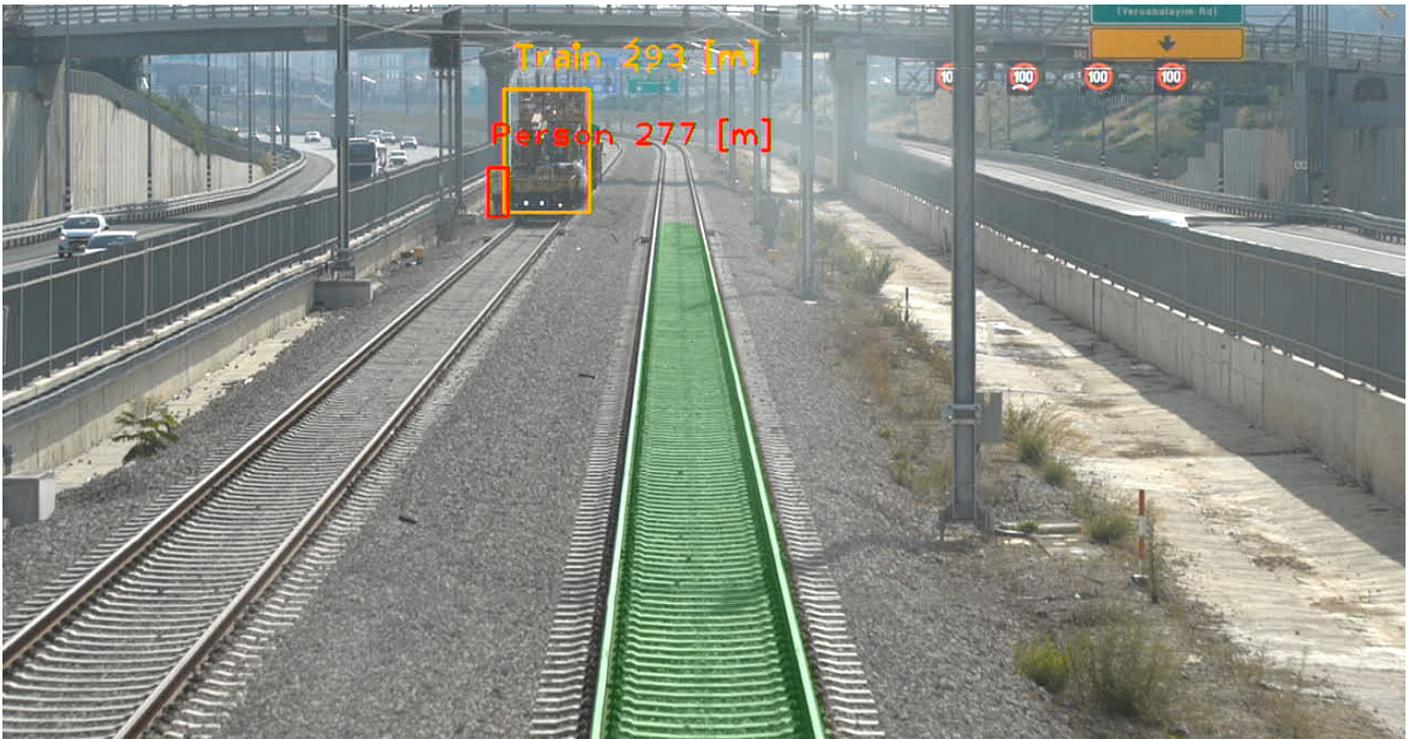
Shahar Hania, CEO of Rail Vision

"I was familiar with computer vision and knew its capabilities – and limitations. I could see that AI was the only technology that could do what we wanted," he explains.

This is because, unlike computer vision, AI has the ability to imitate intelligent human behaviour and enables machines to process information and make decisions based on logic and reasoning. Taking into account a broader set of factors, it can determine the best-possible outcome based on the input it receives.

World First Technology

AI, paired with electro-optic sensors and deep learning, is what enables Rail Vision's solutions to detect and classify obstacles such as people up to 1.5km ahead, while



trains and cars can be classified 2km ahead.

Monitoring a predefined area of interest, the system generates real-time visual and audio alerts for both the train operator and the command-and-control centre, and is, to date, the only system that can detect and classify a person at risk in time to avoid a collision.

Systems have been developed not only for **mainline** environments, but also to streamline and enhance the safety of shunting operations.

Similarly to the mainline system, Rail Vision's **shunting yard system** detects and classifies objects on and around tracks, ensuring safety in what is a busy environment. Monitoring operational dead zones also enables safe and secure wagon coupling with the company's one-of-a-kind pathfinder technology that detects switch states.

Big Data Services

Rail Vision's monitoring systems can be customised to meet customers' specific needs, as can its **big data service add-on**.

This analysis of railway infrastructure and surrounding ecosystems, through GIS mapping, allows ongoing infrastructure inspection, environmental trend analysis and image-based navigation.

Tailored reports are provided that support predictive maintenance, enhancing resource planning and quality assurance.

"By collecting and analysing big data you don't have to wait until there's a problem. You can monitor a situation and plan your maintenance ahead of time," Hania explains.

"Take vegetation penetrating the track, for example. You can monitor growth to know when

it will need to be cut back. Long-term monitoring enables you to learn specifically where vegetation is an issue, and you can make adjustments to where you send maintenance teams. This saves time and money.

"Another example is pantograph and catenary monitoring and analysis. This will enable you to predict when problems will occur and prevent them, providing savings in terms of costs and downtime," he points out.

Benefits of Rail Vision's Advanced System Capabilities

Rail Vision's advanced system capabilities offer rail companies a myriad of benefits.

Analysts report that condition-based and predictive maintenance can provide combined efficiency gains of 15–25% and that

predictive maintenance alone can lead to up to a 10% savings in maintenance costs.

The latter equates to possible annual savings of three billion euros (3.37bn USD) for rail operators, 2bn euros (2.24bn USD) for third parties, and 1bn euros (1.12bn USD) for rolling stock OEMs.

Add to this the priceless lives saved thanks to avoiding a collision or derailment and the benefits are clear to see.

“Just think, every time there’s an accident there are costs – these may take the form of human casualties, money, infrastructure or unplanned downtime. Our system has already been proven to reduce these by avoiding accidents and optimising

predictive maintenance,” says Hania.

“By preventing just one collision or derailment you’ve gone far beyond a return on investment.”

Discover How Rail Vision Could Help You

As a young, agile technology firm, and the first to bring this technology to market, Rail Vision continues to be a pioneer in the field of rail safety and maintenance.

Always looking for new challenges to solve, the team has been working on a number of innovative solutions including an autonomous braking demonstration with Swiss Federal Railway’s Cargo subsidiary (SBBC).

This is currently in the final stage of an operational field test on an SBBC locomotive in Switzerland, and operators from across Europe have been coming to view the solution in action.

Keen to keep pushing the envelope, Rail Vision would love to hear from like-minded rail companies.

Why not **get in touch** to see how Rail Vision’s technology could benefit your business?



INTELLIGENCE ON TRACK

Taking rail into the future, making it safer, more efficient, reliable and sustainable, using advanced sensors, AI and Big Data technologies.



MAIN LINE SYSTEM

Combining the power of computer vision and advanced electro-optics sensors to improve the safety of trains. Detection and classification of obstacles up to 2000 meters on and along rail tracks under all weather and light conditions.



SWITCH YARD SYSTEM

Real time obstacle detection with visual and acoustic alerts to insure ongoing operation and maximizing efficiency. Enabling remote operation of shunting locomotive matching the future automated shunting yard.