Rail Vision: Quantum Transportation Delivers First Transformer-Based Neural Decoder for Universal Quantum Error Correction

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Achieves superior decoding accuracy and dramatically improved efficiency compared to leading classical algorithms

Ra'anana, Israel, Jan. 15, 2026 (GLOBE NEWSWIRE) -- Rail Vision Ltd. (Nasdaq: RVSN) ("Rail Vision" or the "Company"), an early commercialization stage technology company seeking to revolutionize railway safety and the data-related market, announced today that its majority owned subsidiary Quantum Transportation Ltd. ("Quantum Transportation"), a quantum computing innovator, has achieved a major technical breakthrough with the successful prototype development and rigorous validation of its first-generation **transformer-based neural decoder** - a pioneering, code-agnostic solution designed to advance scalable quantum error correction (QEC).

This innovative decoder harnesses advanced transformer architectures to provide a highly generalizable, machine-learning-driven approach capable of outperforming conventional decoding methods. In comprehensive simulations across diverse quantum error correction codes (including surface code variants) and realistic noise environments, the system has demonstrated **superior decoding accuracy and efficiency** compared to leading classical algorithms, such as Minimum-Weight Perfect Matching (MWPM) and Union-Find.

Highlights of this achievement include:

- Design and finalization of a proprietary transformer architecture specifically optimized for the complex, high-dimensional structure of quantum error syndromes
- In-depth benchmarking and comparative analysis against the current state-of-the-art in QEC decoding techniques
- Strong evidence of generalization across multiple code distances, error rates, and varying noise profiles
- Completion of a solid intellectual property strategy, securing a defensible position for this transformative neural QEC paradigm

This breakthrough aims to support the ongoing collaboration between Rail Vision and Quantum Transportation by combining Quantum Transportation's quantum-AI based intellectual property and innovation with Rail Vision's advanced vision and railway-safety technologies. While the decoder is currently focused on quantum computing research applications, the companies are exploring, on a long-term basis, potential areas where similar data analysis and computing methodologies could be applicable to Rail Vision's core technology.

David BenDavid, CEO of Rail Vision said: "We are pleased with the continued progress at Quantum Transportation. We believe that this breakthrough reflects the strength of its research capabilities and reinforces the strategic optionality of our investment as we evaluate future technology pathways."

About Quantum Transportation

Quantum Transportation proposes to develop a Quantum Error Correction Simulator powered by a patented Transformer-based Universal Decoder (PD). This decoder, leveraging deep learning techniques, generalizes across quantum codes, learns from noise patterns, and delivers a scalable and hardware-agnostic approach to error correction. The patented Deep Quantum Error Correction Transformer (DQECCT) introduces a novel machine-learning decoder that predicts and refines quantum errors using transformer-based architectures, incorporates masking layers derived from parity-check matrices and optimizes a combined loss function over Logical Error Rate (LER), Bit Error Rate (BER), and Noise Estimation Error. This technology aspires to outperform classical decoders (e.g., MWPM) in both accuracy and speed and uniquely handles faulty measurement scenarios. It is adaptable to various codes - including Surface, Color, Bicycle, and Product Codes.

About Rail Vision Ltd.

Rail Vision is a development stage technology company that is seeking to revolutionize railway safety and the data-related market. The company has developed cutting edge, artificial intelligence based, industry-leading technology specifically designed for railways. The company has developed its railway detection and systems to save lives, increase efficiency, and dramatically reduce expenses for the railway operators. Rail Vision believes that its technology will significantly increase railway safety around the world, while creating significant benefits and adding value to everyone who relies on the train ecosystem: from passengers using trains for transportation to companies that use railways to deliver goods and services. In addition, the company believes that its technology has the potential to advance the revolutionary concept of autonomous trains into a practical reality. For more information, please visit https://www.railvision.io/

Forward-Looking Statements

This press release contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act and other securities laws. Words such as "expects," "anticipates," "intends," "plans," "believes," "seeks," "estimates" and similar expressions or variations of such words are intended to identify forward-looking statements. Such expectations, beliefs and projections are expressed in good faith. For example, Rail Vision is using forward-looking statements when it discusses the ongoing collaboration between Rail Vision and Quantum Transportation by combining Quantum Transportation's quantum-AI based intellectual property and innovation with Rail Vision's advanced vision and railway-safety technologies, how the companies are exploring, on a long-term and non-committal basis, potential areas where similar data analysis and computing methodologies could be applicable to Rail Vision's core technology, the continued progress at Quantum Transportation and its belief that this breakthrough reflects the strength of Quantum Transportation's research capabilities and reinforces the strategic optionality of Rail Vision's investment as it evaluates future technology pathways. However, there can be no assurance that management's expectations, beliefs and projections will be achieved, and actual results may differ materially from what is expressed in or indicated by the forward-looking statements. Forward-looking statements are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in the forward-looking statements. For a more detailed description of the risks and uncertainties affecting the Company, reference is made to the Company's reports filed from time to time with the Securities and Exchange Commission ("SEC"), including, but not limited to, the risks detailed in the Company's annual report on Form 20-F filed with the SEC on March 31, 2025. Forward-looking statements speak only as of the date the statements are made. The Company assumes no obligation to update forward-looking statements to reflect actual results, subsequent events or circumstances, changes in assumptions or changes in other factors affecting forward-looking information except to the extent required by applicable securities laws. If the Company does update one or more

forward-looking statements, no inference should be drawn that the Company will make additional updates with respect thereto or with respect to other forward-looking statements. References and links to websites have been provided as a convenience, and the information contained on such websites is not incorporated by reference into this press release. Rail Vision is not responsible for the contents of third-party websites.

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