

## **Robot Kamaz is opening its computer vision eyes**

VIST Group (subsidiary of ZYFRA Group) mutually with Nazarbayev University and KAMAZ launched a robotized towing truck project. A fifth-wheel towing truck Kamaz Neo will be equipped with computer vision systems that will allow it to detect a range of objects like people, animals, traffic barriers, cones and autonomously recalculate the route considering this kind of obstacles.

“As a part of the project we have designed a computer vision module for a robotized truck on a base of Kamaz 5490 Neo chassis, adapted computer appliance complex, developed and integrated automated planning and self-adjusting to obstacles route steering systems” – commented the VIST Group Head of the Project Artem Fedotov.

VIST has recently successfully robotized BelAZ 7513R truck and BelAZ 78250 front loader for open-pit mining. The implementation of the Kamaz autonomous truck is planned to take place on two fronts: 1) The robot Kamaz due to its smaller (compared to BelAZ) external dimension is more maneuverable and can facilitate the logistics of closed industrial zones at manufactures of various types, 2) In the long run, a train of Kamaz robot towing trucks could serve for long-distance transportation, probably on a separate lane.

The team is planning to finalize the project by September 2019.

“We are working on technical adaptation and further development of computer vision modules for Kamaz Neo autonomous piloting. In cooperation with VIST Group specialists who deliver all the necessary additional equipment and software, we have started the project. We are implementing functions of route planning, generation of route control commands and obstacle detection to the software” – said senior scientific researcher of NLA Zhandos Yesenbayev.

The statistics (<https://www.statista.com/statistics/261156/heavy-truck-production-worldwide-by-region/>) shows that in 2017 there were around 4.2 mln heavy trucks produced worldwide. While for the first time since 2011 the decrease tendency in truck production seems to be overcome, the road transport industry is continuously facing the problem of shortage of truck drivers. As European Road Freight Transport 2018 survey by Transport Intelligence reports, that European road transport firms are racing towards a driver shortage crisis of 150,000 unfilled jobs. Just the UK alone is experiencing shortage of 52,000 drivers, closely followed by Germany with 45,000 vacancies and France with 20,000 vacancies. The predictions says that that amount will only increase. The same situation is on the US market. The fully robotized truck could partially solve the problem at least within industrial zones.

By now ZYFRA and it's subsidiary VIST offers the global market its Autonomous system for drills and Autonomous and tele-operated system for mining vehicles as well as selfdriving trucks and loaders based on BelAZ. Autonomous drilling can bring 16% of productivity increase, while autonomous guidance from hole to hole (based on the electronic design imported from planning system) brings 18% of productivity increase. tele-operated system for mining vehicles: autonomous trucks, autonomous drills, assisted smart remote control, loaders, dozers, shovels, graders.

On top of international expansion, the company is eager to complete its “Intelligent mine” project – a complex solution for unmanned surface mining with application of self-driving

vehicles. VIST is planning to spend a material share of investment provided by ZYFRA to accelerate its R&D projects including self-driving vehicles, autonomous surface mining machines (robots) and appliances, broader IoT and AI based solutions application as well as predictive analytics.