MOBILE REAL TIME VIDEO STREAMING OVER CONTROLLED VEHICLES

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INTRODUCTION.

Mobile Real Time Video Transmission combines wireless telecommunications and Imaging in order to provide remote video transmission [1-3]. By removing distance barriers, it improves access to different services that would often not be regularly available in distant rural communities. It also saves lives in critical scenarios like oil field inspection, monitoring oil and gas pipelines, and security. Wireless networks always suffer from different factors like a bad weather conditions, fading, multipath interference, which leads to a weak signal, thus packet losses or delays occur and make the video quality unacceptable. The aim of the project is to enhance the video quality over the weak signal for a real time video wireless transmission for controlled vehicles (Car and Quadcopter, Fig.1 and Fig. 2).

Figure 1. *Quadcopter inspection of oil and gas field*

Figure 2. *Oil and gas pipelines.*

METHODOLOGY.

Enhancement of the Video Quality: Outdoor and indoor propagation models will be taken into accounts and choosing the optimal propagation model will be the results of this investigation. Testing different vehicle speeds with the wireless video transmission considering the signal strength will be shown the video streaming quality by using PSNR measurements. The vehicle(s) activities (functioning, video capturing and transmission) will consume the battery's energy and therefore the optimization protocol for better energy consumption and efficiency will be developed. The ultimate results will be reached by reducing the jitter and delays in the channel.

Monitoring: Several key industrial infrastructure projects for energy supply and delivery, like oil and gas pipelines or renewable energy infrastructures, require constant monitoring and surveillance for structural integrity, verification of correct operation, etc. Within these contexts, beyond human monitoring, it is crucial to have automated monitoring, especially in areas where it is difficult to access and difficult to maintain constant presence and where it is difficult or impossible to ensure power supply for the monitoring infrastructure itself. The proposed research can ensure long-term visual surveillance via the proposed solution without the need to replenish battery supplies often. Crucially, the proposed solution will be adaptive and robust even when some visual sensors or even LTE wireless routers

malfunction. Essentially, this means that expensive and safety-critical infrastructure can be monitored 24/7 without expensive and error-prone human intervention by mobile real time video streaming over the controlled vehicles (cars and quadcopters).

CONCLUSIONS.

The project points to the national needs in two respects both Energy (Oil and Gas) and Environmental issues, which are going to be presented through *Expo 2017*. It will tackle optimisation of the new High Efficiency Video Codec and it will challenge wireless network technology, as both can improve wireless communication systems. The research investigation will open a new area that merges mobile multimedia with cutting-edge of technology to provide better communication services for the needs of oil industry and environment monitoring in the Republic of Kazakhstan.

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