



Synthesis of the law of motion control for a swarm of autonomous drones using the method of mobile cellular automata

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Abstract. We consider the construction of motion control system for a swarm of drones using the methods of the elasticity theory from continuum mechanics. For a swarm of drones in the form of a linear chain, the problem of maintaining the initially specified shape throughout the entire time of movement is solved. The theory of mobile cellular automata is applied to construct a mathematical model of the chain of drones. By passage to the limit, equations of longitudinal and transverse oscillations of the chain are obtained, similar to those of the longitudinal vibrations of a rod and the transverse oscillations of a stretched string. The longitudinal and transverse oscillations of the resulting system, resulting from the influence of external perturbations are investigated, as well as the effect of these oscillations on the stability of the swarm configuration.

Keywords: scanning lidars, ToF-scanners, computer vision, mobile cellular automata, swarms of autonomous vehicles, wave equation, motion control

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