SUMMARY

The diploma project contains 106 pages, 64 pictures, 2 tables, 6 graphic material sheets.

The aim of this project is the development of virtual libraryof physical models of mechanical systems, comparing them with the structural mathematical models in *Simulink* environment and formulation of guidelines on the usage of the *SimMechanics* library of *Matlab* toolkit.

Analytical review of virtual environments that provide tools for the electromechanical systems analysis have been held. Also, the basic virtual physical model in the literature have been analyzed, as well as their disadvantages and assumptions.

The calculation, development and exploration of different mechanicsms of the overhead, rotary crane and robot manipulator were carried out using models in Simuling and SimMechanics. Throught the comparative analysis of obtained transients the adequacy of models was proved.

The exploration of twin-engine drive using SimPowerSystems functionality was carried out.

MECHATRONICS, OVERHEAD CRANE, ROTARY CRANE, DEGREE OF FREEDOM, TWIN-MOTOR DRIVE, ROBOTIC MANIPULATOR