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## Synthesis of Asymptotically Stable Motion of a Robot Arm Manipulator

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The paper is about an active control problem. It solves the inverse problem of dynamics and concerns with construction of program motions of non-autonomous mechanical systems. This study is important and necessary in software design of automated systems for control of mechanisms. In particular, it is used in various modeling problems of robot-manipulators. Here, we construct all possible asymptotically stable program motions for a model of robots arm-manipulator, which is simulated by a mechanical system with three degrees of freedom. The control force is obtained in the form of closed form solution in the class of continuous functions. The stabilization problem is solved by the direct Lyapunov's method with the use of limiting functions and systems. In this case, we are able to restrict ourselves to Lyapunov's functions having constant sign derivatives. Our results are a valuable contribution to development of control mechanisms in robotics and engineering.

*Key words:* programm motion, stabilizing control, the method of Lyapunov's functions.

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