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Contribution to the Study of the Synthesis of Biped Motion with Enhanced Degree of Anthropomorphism

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Abstract

For a long time already, robots have not been present only in industrial plants, at the time their traditional workspace, but have been increasingly more engaged in the close living and working environments of humans. This fact inevitably leads to the need of "working coexistence" of man and robot and sharing their common working environment. Since no significant rearrangement of the human's environment because of the presence of robots could be expected, robots will have to further "adapt" to the environment previously dedicated only to man. However, in the time to come it will be inevitable to accept the necessity of cooperative activities of man and robot, and make a step in the direction of increasing comfort of their joint action. The term humanoid induces the question – what makes the robot more or less human-like? In other words, the question of anthropomorphism arises.

This paper attempts for a first time to ask proper questions about anthropomorphism and eventually tries to offer some answers. At the beginning, the elements of the anthropomorphism are pointed out and then some means of expressing them quantitatively and qualitatively are suggested.

After a short description of the utilized "semi-inverse" method of gait synthesis, a new idea of "distributed compensation" is presented, followed by two examples of gait synthesis in the absence of disturbances. Then, role of active movements of hands is investigated and different movements by hands simulated. Finally, the results are analysed and the advantages pointed out.