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RESEARCH AND DEVELOPMENT OF A CONTROL SYSTEM FOR THE SYNCHRONIZED MOVEMENT OF THE HEAD OF AN ANTHROPOMORPHIC ROBOT

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When considering the development trends of modern industrial robotics, special attention is drawn to a relatively new direction - collaborative assistant robots and telepresence systems that work in a common environment with a

person[1], for which they need the mobility of manipulators, combined with the latest achievements in the field of control systems and artificial intelligence.

The purpose of this work is to expand the functionality of telepresence systems by implementing mechanisms for synchronizing the viewing direction with the position of the operator's head.

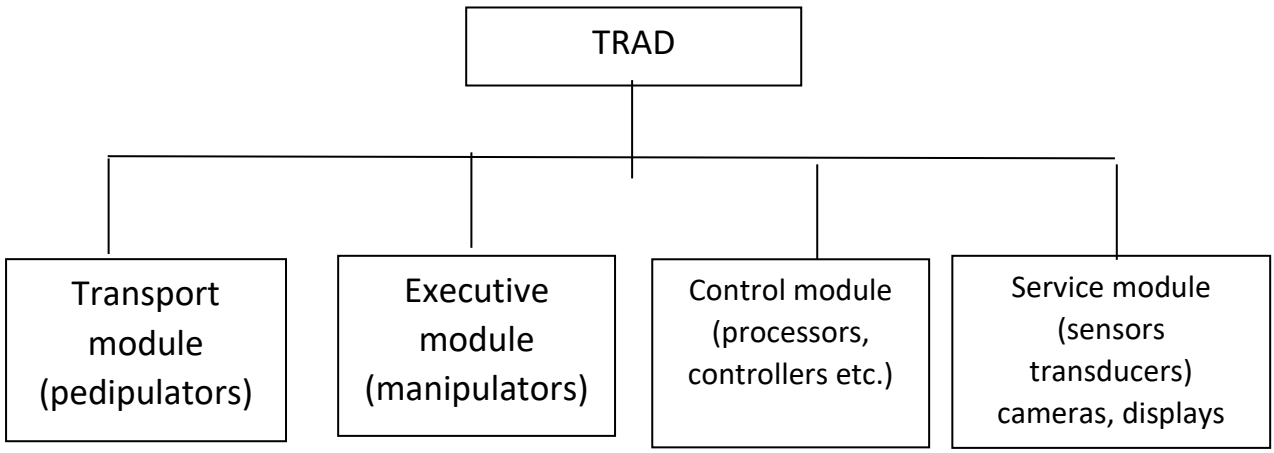

Figure. 1. Modular structure of an anthropomorphic robot

The anthropomorphic robot's synchronized head movement control system is based on the Arduino UNO R3 debug board with the ATmega328 microcontroller[2]. The position of the operator's head is tracked by means of a gyroscope sensor and an accelerometer based on the MPU-6050 chip, which is connected to the control board via the I2C interface. Trim and roll angles are measured using the vector of gravity and velocity during rotation. Displacement in space is determined analytically based on linear acceleration and angular velocity. Stepper servo drives are used as actuators to control the direction of the robot's view, commands to which are issued through the discrete outputs of the ATmega328 microcontroller[3,4].

The results of this project can be used to create telepresence systems in enterprises with hazardous working conditions, for example, in chemical plants or when working with aggressive or radioactive materials. This will help protect the operator from receiving life-threatening and health effects in the event of any equipment failure or other emergency situations.

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ТЕРМОМЕТРЫ ДЛЯ БЕСКОНТАКТНОГО ИЗМЕРЕНИЯ ТЕМПЕРАТУРЫ

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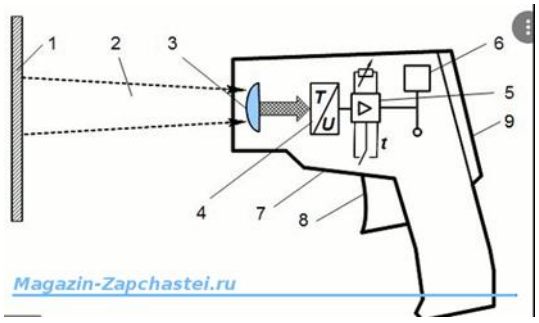
Известно, что температуру тела человека измеряют с помощью термометров. В домашних условиях часто используются жидкостные термометры, в которых используется спирт или ртуть. Но их использование может быть опасным. Поэтому бесконтактные инфракрасные термометры все чаще становятся альтернативой. Это современное решение позволяет быстро и бесконтактно измерять температуру. Они просты в использовании, удобны, безопасны и дают быстрый результат.



Что такое инфракрасные термометры?

В последнее время традиционный ртутный термометр заменяется более современным инфракрасным измерителем. Инфракрасный прибор является одной из самых востребованных технических новинок для измерения температуры в последние годы. Несколько простых действий, несколько секунд времени – и температура тела будет отображаться на дисплее. Благодаря точности результатов и оперативности работы прочный универсальный прибор не останется незамеченным многими пользователями.