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Abstract:

The Zymark™ System is a lab automation workstation that uses the Caliper Life Sciences (Hopkinton, MA) Zymate XP robot. At Indiana University-Purdue University Indianapolis, a Zymate is used in a course, INFO I510 Data Acquisition and Laboratory Automation, to demonstrate the fundamentals of laboratory robotics. This robot has been re-engineered to function with National Instruments™ graphical software program LabVIEW™. LabVIEW is an excellent tool for robotic control. Based on changing conditions, it is able to dynamically use data from any source to modify the operating parameters of a robot. For dynamically changing information, storage of that information must be readily accessible. For example, there is a need to continuously store and update the calibration data of the robot, populate the setting of each axis and positioning inside the workplace, and also store robot positioning information. This can be achieved by using a database which allows for robotic control data to be easily searched and accessed. To address this need, an interface was developed which would allow full, dynamic communication between any LabVIEW program (called "virtual instruments," or VIs) and the database. This has been accomplished by developing a set of subVIs that can be dropped into the calling robotic control VIs. With these subVIs, a user has the ability to create table and column information, delete a table, retrieve table information by clicking a particular table name on the user interface, or query using any SQL-specific combination of columns or tables within the database. For robot functionality, subVIs were created to store and retrieve data such as calibration data points and regression calculations.

Description:

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