Programming of Robotic Arms for Automatic Sample Change on the REGATA Facility of the IBR-2 Reactor

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Performing of neutron activation analysis at the REGATA facility of the IBR-2 reactor is associated with irradiation and measurement of the large number of samples. In 2022, four robotic arms (KUKA KR10 R1100, Germany) were purchased in order to ensure simultaneously measurement of samples and to replace outdated sample changers. The replacement of the changing devices created the need for a new software since the current one does not support the introduction of new devices.

The new software is based on the object-oriented language (OOL) C# and the .NET Framework. The use of OOL allowed to create a separate class for manipulator control. This will make it easy to upgrade the program if the number of robots will change: objects of this class are created or deleted. The .Net Framework will avoid the problem of outdated software libraries by keeping them up to date. This ensures that the program will run on modern versions of Windows OS.

The created software allows users to simultaneously control the operation of all manipulators and set individual measurement parameters (measurement time and number of samples) for each robot. The program was designed as a graphical application for the convenience of users. The GUI was developed using the UI framework Windows Forms.