Touchscreen Testing

Touch testing of device controls and interfaces is still often a manual process. Automating touch testing of buttons, dials, and touchscreens offers a way to ensure consistent production quality and deliver the fine-grain traceability needed to drive quality even higher.

To use a robot for automated test, not only must the robot have the dexterity required for the test tasks, but the solution must deliver a compelling ROI. Typically, the total cost of deployment is dominated by the effort to program a robot for a task. With the Cyton Gamma arms, initial setup usually takes under an hour and training the Cyton for a basic test task can be done in under a day.

The Cytons, with 7 axes, have the dexterity to grasp a knob or handle, gesture across a screen, or swipe an NFC card from a variety of angles. In addition, the Cytons are powered by Energid's Actin software, developed for NASA and deployed for industry to drastically simply the training of complex manipulation tasks.

A strength of Actin is that you can freely control the Cyton arm's gripper position and orientation in real-time. Actin solves for the joint values to achieve the desired gripper or end-tool pose. For automated test, the end-tool can be a gripper, stylus, force-torque sensor, or other sensor.

Actin includes a real-time constraint-solving engine. This lets you specify target velocities, acceleration limits, and path precision for the end-tool through any waypoint in the motion path. An example of a more powerful use of the constraint engine is the ability to swipe across a surface. You give Actin the direction of the surface, then tell it to constrain Cyton's gripper or the stylus it holds to only move along that surface.

Actin uses coordinated control of the Cyton's 7 degrees of freedom to move the stylus fluidly along the surface. You can then programmatically specify a gesture or interactively create a gesture motion. Actin will ensure that the Cyton stays constrained to the plane of the touchscreen as it executes the gesture.

Another common test motion is to set the arm to only rotate about a given axis. Since the Cyton can use coordinated motion of all of its 7 axes for the rotation, that axis can be at almost any orientation in space. This is particularly useful for touch testing of knobs, dials, handles, and levers.

An automated test solution should require minimal or no changes to the existing test process. The Cyton can be quickly clamped to a benchtop in the test area. The Cytons have a compact footprint with reach appropriate for most human-scale tabletop tasks. Importantly, the Cytons are inherently safe near people. No fencing, cage, or lock-out setup is required, saving substantially on footprint and deployment cost.

The Cytons can directly manipulate the units under test, or can pick up an object such as stylus, access card, or payment card to interact with the test units.