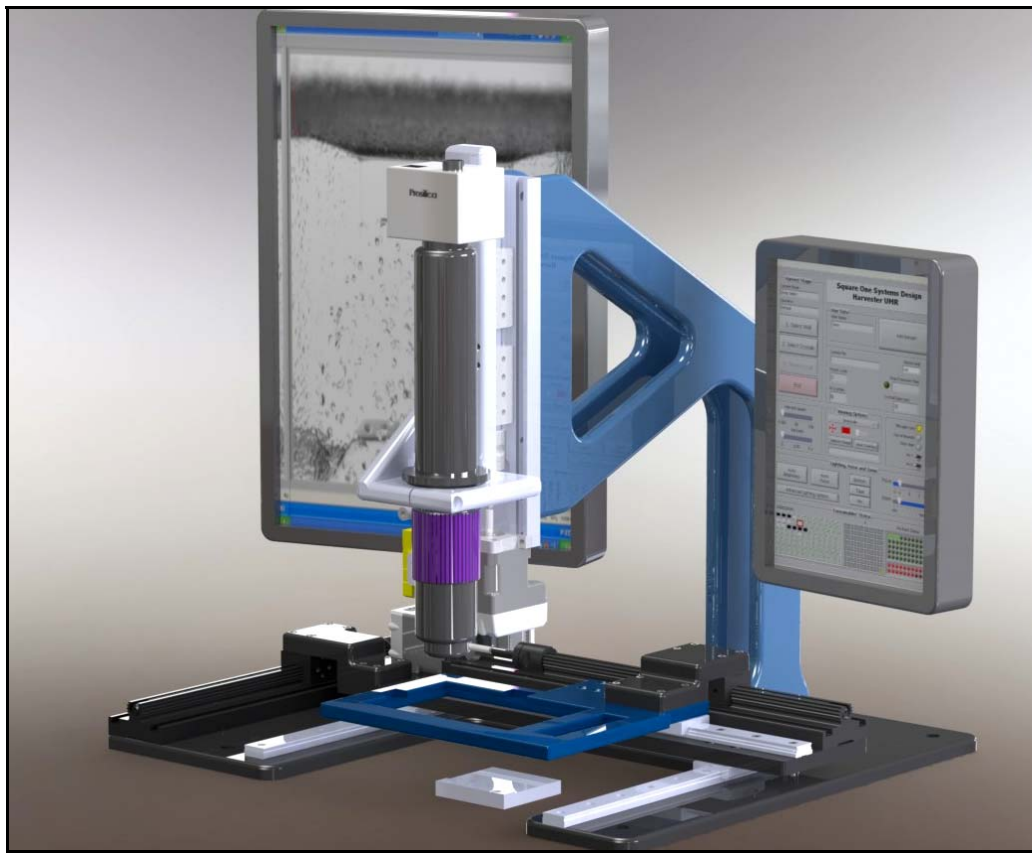


Desktop Crystallography Station

Square One
Systems Design

Square One's Desktop Crystallography Station is an innovative system designed to increase the speed and precision of the crystal harvesting process. The Station incorporates many of the capabilities originally developed for Square One's fully-automated Universal Micromanipulation Robot and makes them available in a compact, affordable unit. Created with researchers in mind, the Station's large display, intuitive graphical controls, and sleek ergonomic design serve to streamline every aspect of the crystal harvesting process.



High Resolution Crystal Imaging

The Crystallography Station teams a 2 mega-pixel GigE Vision camera with a motor-driven zoom lens to generate sharp images with better than 1 micron of resolution. Automated focus, zoom and a range of lighting options allow an operator to effortlessly fine tune each image. Images are ported to a 19" flat panel display. This display is adjustable, allowing it to be positioned for optimal viewing. Because the Station is web-enabled, all in-process crystal images can also be viewed (or reviewed) remotely.

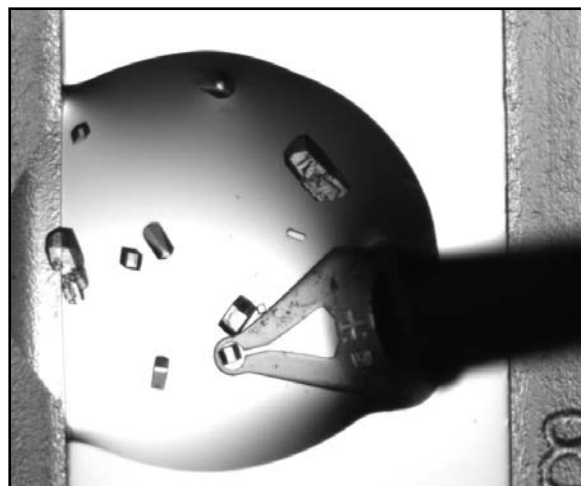


Image Analysis

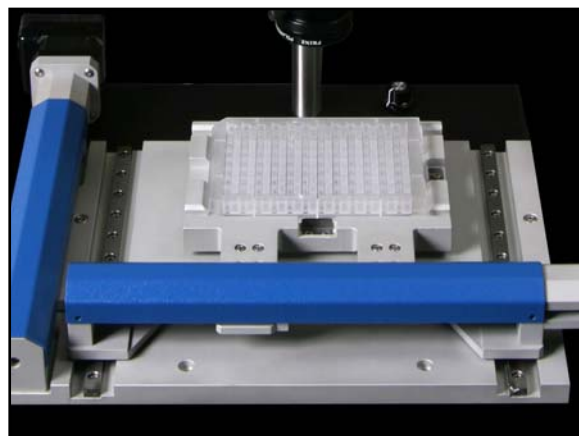
A powerful suite of machine vision algorithms are incorporated into the Crystallography Station. These tools instantly quantify the size, shape and location of each crystal contained within an image. Based on this information, the Station will recommend the appropriate harvesting tip for a particular crystal. In addition, since the image analysis algorithms can determine whether an object is present within a well, the Station can autonomously screen in-process microtiter plates for the presence of crystals.



output array						
0	0	-226.95	493.93	62.898	2051.1	1.8718
0	1	257.91	453.97	248.13	24154	2.4803
	2	-146.54	398.88	60.532	1446.1	2.5338
	3	-78.27	89.174	335.7	27841	3.4047
	4	-297.47	-55.389	254.96	24413	2.5466
	5	651.75	-66.687	240.8	26215	2.1097
	6	-603.3	-83.151	102.27	6074.4	1.6582

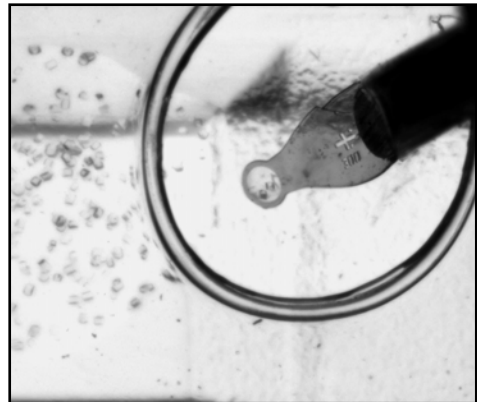
Automated Microtiter Plate Alignment

Incoming microtiter plates are loaded onto a motorized X-Y stage which positions the plate's wells relative to the Station's imaging optics. This stage accepts and accurately registers all commonly-used commercial plates. Once loaded, an operator can select from a menu of automated motion routines or can command the plate to move directly to a desired address.



Tape Punch

Prior to harvesting, the tape covering a well is typically removed using an X-Acto knife. The Crystallography Station replaces this tedious process with a high-precision thermal punch that vaporizes an opening in the tape. This opening is sized to provide the operator with easy access to a crystal of interest while minimizing evaporation of the mother liquor within the well.



Integrated Data Tracking

Integrated bar code readers and image capture software incorporating optical character recognition are used to automatically generate a detailed electronic record of every crystal harvested. This record will typically include an identifier for the microtiter plate and the address of the specific well from which each crystal was harvested, an identifier for the Hampton pin used to harvest the crystal, the cryo-protection and cryo-cooling protocols used, the name of the operator, the date and the time. All of these data are augmented with high-quality digital images of the process. The electronic records generated by the system can be accessed remotely via the web.



About Square One

Square One is a multi-disciplinary engineering company that specializes in the development of innovative automated workcells, robots, and precision positioning devices. Based in Jackson Hole, Wyoming, Square One maintains state-of-the-art laboratory and manufacturing facilities staffed by a team of skilled professionals.

Station Layout:

