

SEM and DualBeam automation with the AutoScript python interface

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Repetitive electron microscopy tasks that could be automated are often not due to the microscope/instrument manufacturer not allowing control of these systems. Manufacturers chose the most commercially viable routines to sell as dedicated software such as "Auto Slice and View" or "Auto TEM" and these applications are quite successful for high volume applications. Unfortunately, many applications that are routine and repetitive are extremely specific to real research needs and there has not been a great interface for control and automation for SEM and DualBeam™ systems to meet this need. With Python emerging as a premier open source scripting language for scientific research, Thermo Fisher Scientific has developed a Python interface library ("AutoScript") as the interfaces to the SEM and DualBeam platforms with modern operating systems.

The AutoScript API allows control of most all microscope functions including setting and reading values, calling auto functions, saving images, storing values and tracking drift. Many nice examples of custom scripts have been already created to adjust settings with a feedback loop, extract and graph in situ data, and perform image capture automatically. The availability of so many Python based routines in the open source environment allows various components to be combined for specific purposes. With the ability to control both the SEM and FIB columns, GIS, Manipulator, and other accessories, this interface allows really writing advanced automation for most tasks. Python libraries exist for image matching, data display and data export that complete the suite of capabilities needed for custom automation. Currently the AutoScript platform is developed for Thermo Scientific or FEI branded SEM and DualBeam systems on windows 7 or newer operating systems.