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**Purpose:** To remotely automate data collection and give users control of their acquisitions through Leginon Remote

**Authors:**

**Approved:**

**Date:** 2020/07/08

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*Note: As of July 8, 2020 Leginon Remote is in beta release. These instructions are for the release candidate expected to be pushed July 9, 2020. Leginon Remote is a program developed by NRAMM and NYSBC and is being demonstrated as a potential access workflow through the NCCAT embedded trainee program.*

### 1. Purpose:

- 1.1. To remotely access data collection and give users control of their acquisitions through Leginon Remote.

### 2. Scope:

- 2.1. Acquiring data sets from microscopes manually is very time consuming, the ability to automate with Leginon on-site has proven to be efficient; our new ability to conduct these acquisitions remotely, in addition to creating an interface that is easy for users to operate, proves to be highly productive.

### 3. Definitions

- 3.1. Leginon is a system designed for automated collection of images from a transmission electron microscope; it includes the python-side programs written in python and c, the MySQL database and server, and the mainly php-based image and data viewers on a web server.
- 3.2. Leginon Remote is an infallible web interface that allows center staff operators to hand over control of the requested transmission electron microscope to users for their own data acquisition.

### 4. Responsibilities:

- 4.1. Ahead of your session verify with your appointed center staff member that you have been issued Leginon user accounts, and have a registered and approved Leginon project.
- 4.2. Login to Leginon Remote <https://leginon-remote.semc.nysbc.org/>
- 4.3. Once the microscope operator has calibrated the session, they will relinquish control of the session to the user.
  - 4.3.1. Click the "Home" button to refresh the page
  - 4.3.2. Under Control Status, it should read: "User has control on [microscope] session"
- 4.4. Click "**here**" in the Notification section
  - 4.4.1. This is the control panel for the Remote Leginon session



#### 4.5. Sidebar Menu

##### 4.5.1. Main Menu

- 4.5.1.1. Square\_Targeting node
- 4.5.1.2. Hole\_Targeting node
- 4.5.1.3. Exposure\_Targeting node

##### 4.5.2. Leginon Status (status of the current action in queue)

##### 4.5.3. Leginon Tools (contains operation buttons for each node)

- 4.5.3.1. Square\_Targeting button will reload the atlas so that you can choose the next square
- 4.5.3.2. Hole\_Targeting button will submit the hole targets to the queue
- 4.5.3.3. Exposure\_Targeting button will submit the exposure targets
  - 4.5.3.3.1. *If this button is not available, it means that automated targeting is set up and you do not need to submit targets yourself.*
- 4.5.3.4. Scope\_Control buttons play all nodes, pause all nodes or abort all nodes

##### 4.5.4. Time

- 4.5.4.1. Indicates the start and end date/time of the session in addition to a progress bar

##### 4.5.5. Chat Window at the bottom of the page, allows you to communicate with staff as needed

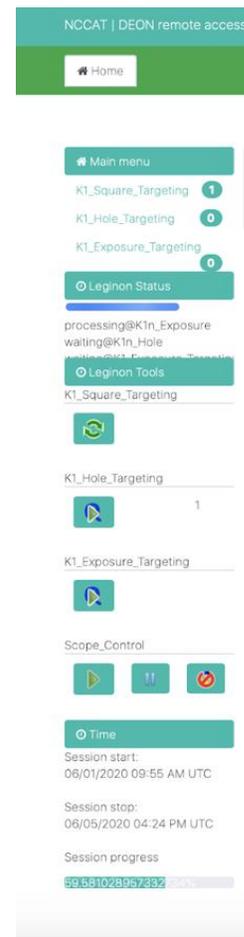
#### 4.6. Things to keep in mind:

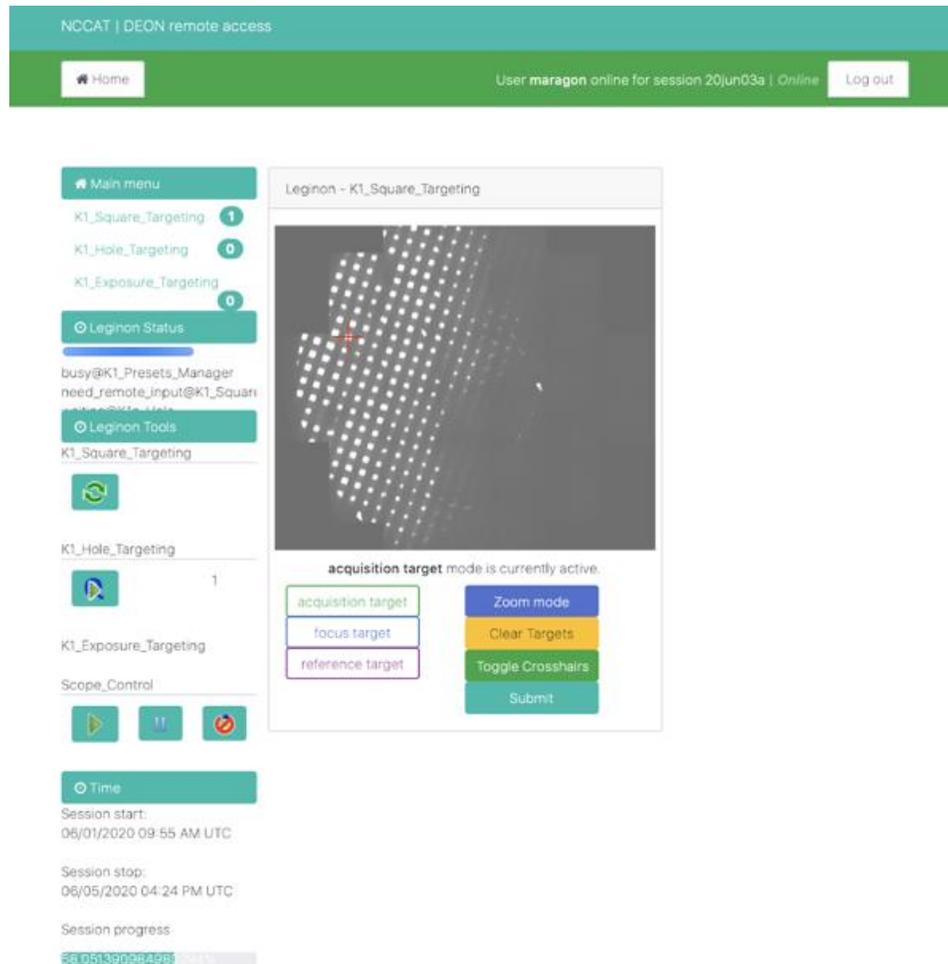
- 4.6.1. Selecting any option in the interface has a slight delay, so please be patient; click it once and wait for a response. If an option is selected before the action is completed, an error will appear cautioning the user to wait
- 4.6.2. Do not submit both Hole\_Targeting and Exposure\_Targeting queues at the same time, an error will appear stating that the scope is busy

#### 4.7. Square Targeting

##### 4.7.1. Click the Square\_Targeting button (in **Leginon Tools** section)

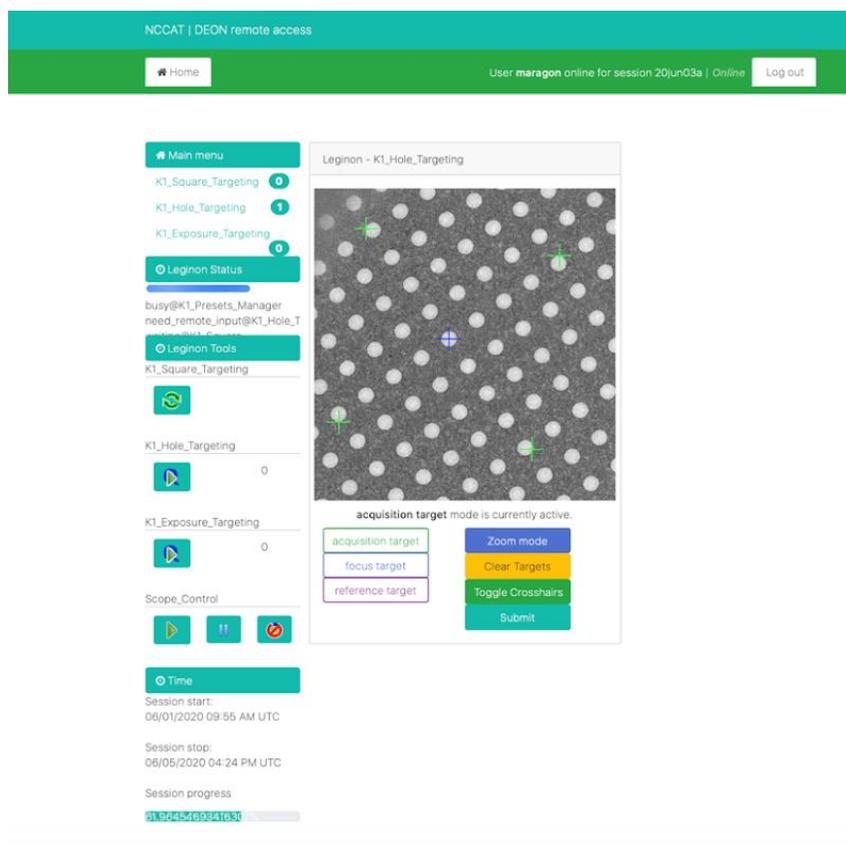
- 4.7.1.1. The Square\_Targeting node (in the **Main Menu** section) should have a (1) to the right, has an image awaiting input
- 4.7.1.2. Click the “*acquisition target*” button and select the squares to image
- 4.7.1.3. Use the “*zoom*” and “*clear targets*” features as needed
- 4.7.1.4. Once selected click the “*submit*” button
  - 4.7.1.4.1. Wait for the images to be processed, once the image is processed, a (1) should appear by the Hole\_Targeting node (in the **Main Menu** section)





#### 4.8. Hole Targeting

- 4.8.1. Click the Hole\_Targeting node (in the **Main Menu** section)
- 4.8.2. Click the “*acquisition target*” button and select the hole targets to image
- 4.8.3. Click the “*focus target*” button and select a focus point (suggested to be equidistant between acquisition targets)
- 4.8.4. Once satisfied with selections, click the “*submit*” button.
- 4.8.5. You will see “*No Leginon images ready for targeting at this acquisition level.*” appear on the screen
- 4.8.6. Wait for the image to be processed. A (1) should appear next to Hole\_Targeting (in the **Leginon Tools** section), now that you have submitted a target
  - 4.8.6.1. This number will increase each time you submit the hole target image and it is added to the queue
- 4.8.7. If you have selected more than one square target, the images will appear one by one in the Hole\_Targeting (in the **Main Menu** section), so repeat until you have submitted all the hole targets for all the squares you have chosen
- 4.8.8. Once you have submitted all of the hole targets, click the submit to queue button under Hole\_Targeting (in the **Leginon Tools** section).
- 4.8.9. If the submit queue button is available under the Exposure\_Target (in the **Leginon Tools** section), continue to Exposure Targeting. Notice that a (1) should appear by the Exposure\_Targeting node (in the **Main Menu** section). If the button is not available, automatic exposure targeting is enabled.
- 4.8.10. Refresh your LOI in <http://nccatweb.nysbc.org/nccatweb/> to ensure that your submission is in queue



#### 4.9. Exposure Targeting

- 4.9.1. To select exposure targets, go to the Exposure\_Targeting node (in the **Main Menu** section).
- 4.9.2. Click the “*acquisition target*” button and select the exposure targets to image
- 4.9.3. Click the “*focus target*” button and select a focus target
- 4.9.4. Once done, click the “*submit*” button.
- 4.9.5. You will see “*No Leginson images ready for targeting at this acquisition level.*” appear on the screen.
- 4.9.6. Wait for the image to be processed. Notice that a (1) should appear next to Exposure\_Targeting (in the **Leginson Tools** section), now that the target is submitted. This number will increase each time an exposure target image is submitted because it is added to the queue.
- 4.9.7. If several hole targets are selected, the images will appear one by one in the Exposure\_Targeting node (in the **Main Menu** section), so repeat until all exposure targets are submitted for all the holes selected
- 4.9.8. Once you have submitted all of the exposure targets, click the submit to queue button under Exposure\_Targeting (in the **Leginson Tools** section).
- 4.9.9. Refresh your LOI in <https://nccatweb.nysbc.org/nccatweb/> to ensure that your submission is in queue



NCCAT | DEON remote access

Home User maragon online for session 20Jun03a | Online Log out

**Main menu**

- K1\_Square\_Targeting 1
- K1\_Hole\_Targeting 0
- K1\_Exposure\_Targeting 1

**Leginon Status**

need\_remote\_input@K1\_Exposure\_Targeting  
waiting@K1n\_Hole

**Leginon Tools**

K1\_Square\_Targeting



K1\_Hole\_Targeting

 1

K1\_Exposure\_Targeting



Scope\_Control

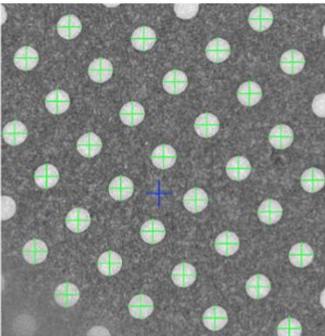
**Time**

Session start:  
06/01/2020 09:55 AM UTC

Session stop:  
06/05/2020 04:24 PM UTC

Session progress  
00:03:17.8577228

Leginon - K1\_Exposure\_Targeting



acquisition target mode is currently active.

acquisition target

focus target

reference target

Zoom mode

Clear Targets

Toggle Crosshairs

Submit