To do automatic particle picking using ETHAN in batch mode:

```
#! /bin/bash

for a in *.mrc;do ~/Downloads/ethan/ethan 139 $a ${a%mrc}box
~/Downloads/ethan/ethan.cfg;done
```

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note: the coordinates of the particles are saved in box files. You have to optimize first the radius of the particle by checking the number and the quality of particles that are picked. The default values of the other parameters do not need to be changed in most cases. You can generate the result image (ppm format image) and check the images. The ppm image shows you the micrograph with the boxed particles.

To generate the result image file (ppm file), you have to edit the ethan.cfg:

```
# Example configuration file for ethan - Teemu Kivioja

# The minimum height of the virus peak compared to the average peak.
HEIGHT_PARAM 0.5

# Minimum distance between two viruses is 2 * SQUARE_WIDTH_PARAM * RADIUS.
SQUARE_WIDTH_PARAM 1.0

# Width of the ring in ring filter is RING_WIDTH_PARAM * RADIUS - RADIUS.
RING_WIDTH_PARAM 1.2

# Distance which the peak can move in x or y direction during center
# refinement is DIST_PARAM * RADIUS.
DIST_PARAM 0.1

# REDUCTION_PARAM * REDUCTION_PARAM pixels are averaged before filtering.
# The value has to be integer
# Special value 0 means that the program determines the parameter.
REDUCTION_PARAM 0

# Is result image file (in ppm format) written. Result image is a scaled
# version of original image with found particles marked with red squares.
# The name of the file is produced by adding ".ppm" to coordinate file name.
# If interactive program is used, this file is not needed. Put 1 for
# yes, 0 for no.
MAKE_RESULT_IMAGE 1

# Is refinement of particle centers performed? Put 1 for yes, 0 for no.
# Producing virus files is not possible when refinement is off
REFINEMENT_PARAM 1

# Is sector test performed? Put 1 for yes, 0 for no.
SECTOR_TEST 1
```

Is height test performed? Put 1 for yes, 0 for no.
HEIGHT_TEST 1

Is peak pair distance test performed? Put 1 for yes, 0 for no.
DISTANCE_TEST 1