

vTrack: Video tracking with openCV

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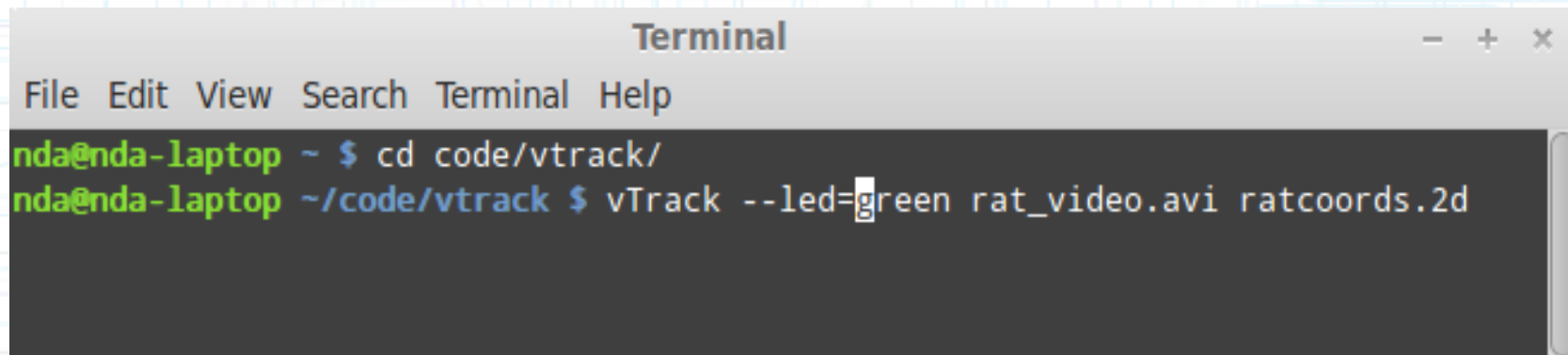
Purpose

- Studies on memory rely on tracking the movements and actions of rats
- New objects are introduced by a scientist, and the rat's memory is judged by how long it chooses to investigate them
- LED's are attached to the rat's head in some trials, but not all

Iteration 1

- Platform: Linux Only
- Interface: Command Line
- User options:
 - Video input filename
 - 2-D Coordinate Pixel output filename
 - Single frame image output filename, marked with LED pixel location
 - Video output filename, where each frame is marked with LED pixel location

- Tracking method: Red, green, or blue LED
- >6x speed
 - 60 minute video analyzed in 10 minutes
- Cannot handle extremely large files (yet)

A screenshot of a terminal window titled "Terminal" with standard window controls (minimize, maximize, close). The terminal has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The prompt is "nda@nda-laptop ~". The first command entered is "cd code/vtrack/" and the second is "vTrack --led=green rat_video.avi ratcoords.2d".

```
Terminal
File Edit View Search Terminal Help
nda@nda-laptop ~ $ cd code/vtrack/
nda@nda-laptop ~/code/vtrack $ vTrack --led=green rat_video.avi ratcoords.2d
```

Iteration 2

- Graphical Interface
 - Video playback
 - Real-time pixel tracking
- User options:
 - Composite image output filename
 - A “heat map” of pixel locations

Iteration 3

- User options:
 - Advanced Tracking Options
 - Machine Learning, User Input
- Determine animal orientation
- Windows compatibility

Iteration 4

- User options:
 - Even more selections for tracking method
- >10x speed
- MacOSX compatibility

vTracker0.0.4 - Emory Dept. of Neuroscience

Browse...

Select video file

Help



Playing: rat_video.avi

Watch

Capture

Stop

Current pixel location: 349x270

Orientation: 104 degrees

Tracking Method

Red LED

Green LED

Blue LED

ML

UserInput

☐ Interpolate

☒ Orientation

Apply

Browse...

output_file.jpg

☐ 2D Coordinates

☐ Current Frame

☐ Single Frame

☐ Composite Image

frame number

Save file

Analyzing...74%