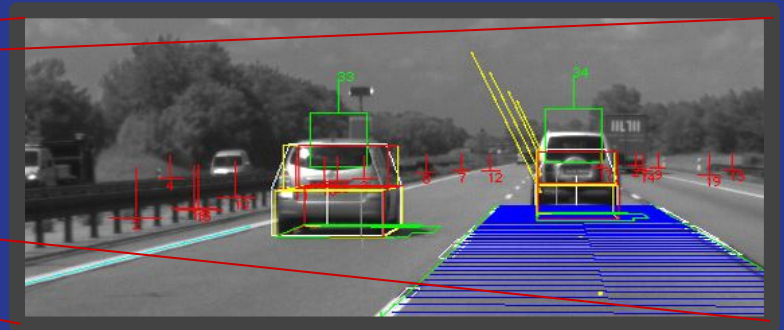
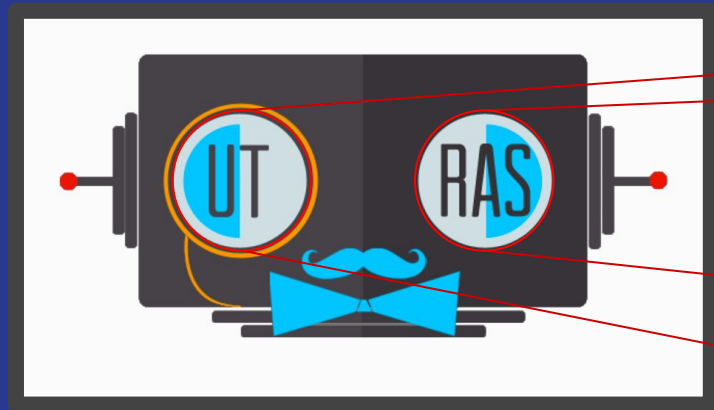


# RAS General Meeting 2

## Computer Vision and OpenCV

February 6, 2018



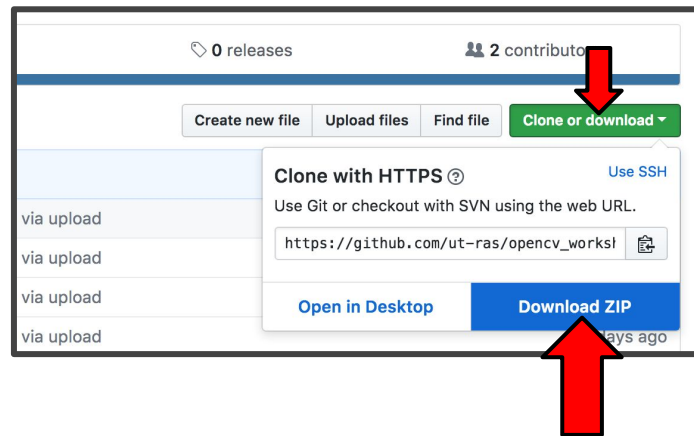
# Grab a seat, and get started on your installation!

1. Download and unzip the repository at the following link in an easy-to-find directory

[https://github.com/ut-ras/opencv\\_workshop](https://github.com/ut-ras/opencv_workshop)

2. Begin following installation instructions in README.md

If you have any issues, please ask one of the leaders!



# How Can You Reach Us?



**Slack:** <https://tinyurl.com/y7fz7a3j>



**Website:** [ras.ece.utexas.edu](https://ras.ece.utexas.edu)



**Facebook:** "UT IEEE Robotics and Automation Society (RAS)"



**Twitter:** @UT\_RAS



**Flickr:** [ut.ieee.ras](https://www.flickr.com/photos/utieee/ras/)



**Github:** <https://github.com/ut-ras>



**HornsLink:** IEEE Robotics and Automation Society



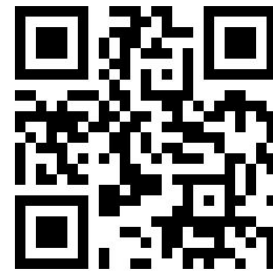
**Meera Wakim, Vice President**

[meerawakim@utexas.edu](mailto:meerawakim@utexas.edu)

Slack: @meerawakim

Facebook: Meera Wakim

Phone: 281-900-5197



**RAS WEBSITE**

# Join committee slack channels to stay up to date!

#pacbot

#region-v

#igvc

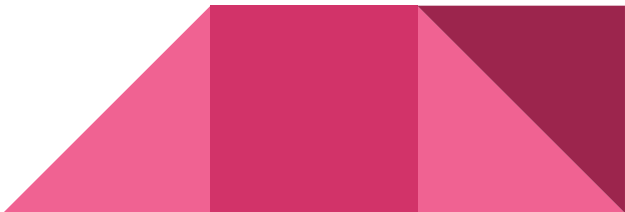
#demobot

#curm

#sportsball

#outreach

What you'll find:

- meeting times
  - meeting locations
  - recent activity
  - past activity
  - witty banter
  - memes?
- 

# How to Become an OFFICIAL RAS Member


If you are a **RAS leader, participate on a committee, or use RAS parts**, you **must** pay semester dues.

- **Semester Dues: \$15**
- Safety Waiver (if you did not sign one for the fall)

We will be accepting dues **at the end** of today's meeting, and at any time the RAS office (EER 0.822C) is occupied by a leader.

**Your dues fund your committees!**

Full perks of membership are outlined in the RAS Constitution at [ras.ece.utexas.edu](https://ras.ece.utexas.edu).



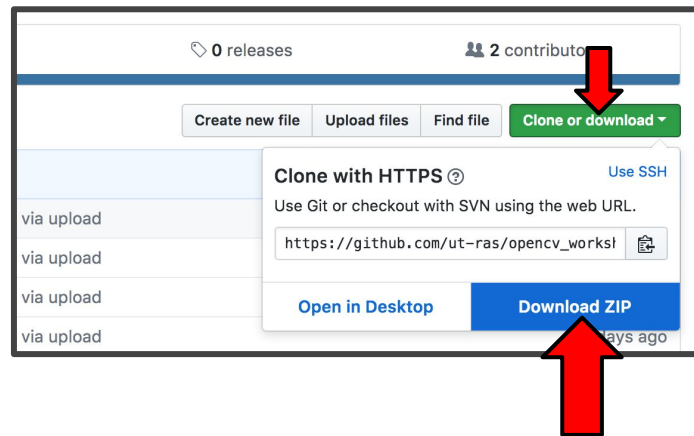
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# Goals

1. Install the tools necessary to learn computer vision.
2. Provide a step-by-step example of a real world computer vision problem, object tracking.
3. Point to resources for independent exploration of OpenCV



# What is OpenCV?

“OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. . . .

The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects, classify human actions in videos, track camera movements, **track moving objects**, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high resolution image of an entire scene, find similar images from an image database, remove red eyes from images taken using flash, follow eye movements, recognize scenery and establish markers to overlay it with augmented reality, etc.” [1]

[1] <https://opencv.org/about.html>





# General Workflow

1. Read an image into OpenCV
2. Pre-process the image (resize, change color space, threshold)
3. Extract features (transformations, draw contours)
4. Post-process the image (analyze contours, extract and overlay relevant information)

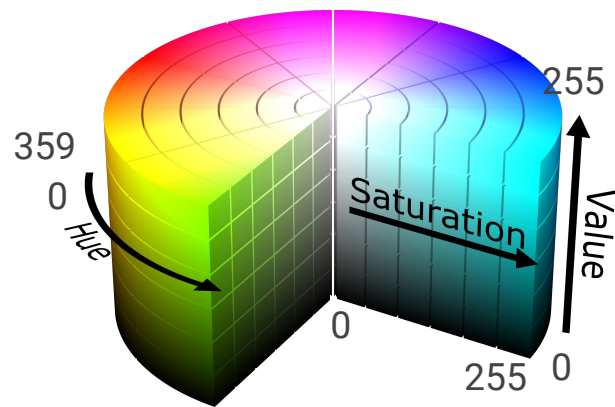


# RGB vs HSV



## Note!

OpenCV takes values for Hue [0 179], Saturation [0 255], Value [0 255]. This means you'll need to scale your hue values from [0 359] down to [0 179].



HSV Color Picker:

<https://alloyui.com/examples/color-picker/hsv>

# Additional Resources

A great video tutorial series on OpenCV:

<https://pythonprogramming.net/loading-images-python-opencv-tutorial/>

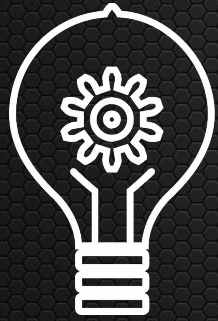
OpenCV's official documentation website:

<https://docs.opencv.org/trunk/index.html>

A long list of OpenCV applications accompanied by tutorials:

<https://www.intorobotics.com/opencv-tutorials-best-of/>





# TEXAS ENGINEERING CREATEATHON

PRESENTED BY THE DEPARTMENT OF MECHANICAL ENGINEERING

- ❖ \$750 for 3-5 people teams
- ❖ Design something awesome
- ❖ Built over March 23-25
- ❖ You keep it
- ❖ Apply by February 16 (Friday)



**[bit.ly/ut createathon 2018](http://bit.ly/ut_createathon_2018)**



**Texas Engineering Create-a-thon**