### **Install cmake 3.7 in a temp folder:**

### cd ~

### mkdir temp

### cd temp/

### wget https://cmake.org/files/v3.7/cmake-3.7.2.tar.gz

### tar xzvf cmake-3.7.2.tar.gz

### cd cmake-3.7.2/

### ./bootstrap

### make

### Then create an alias in your .bashrc file pointing to the new cmake, e.g.

### alias cmake2=~/temp/cmake-3.7.2/bin/cmake

### **Tips and Tricks**

* Review the previous lessons! Andrei, Dominik and co. have given you everything you need. In fact, you've built most of an Extended Kalman Filter already! Take a look at the programming assignments and apply the techniques you used to this project.
* The R matrix values and Q noise values are provided for you. There is no need to tune these parameters for this project. In the unscented Kalman Filter lectures, we'll discuss how to determine these parameters.
* For lidar measurements, the error equation is y = z - H \* x'. For radar measurements, the functions that map the x vector [px, py, vx, vy] to polar coordinates are non-linear. Instead of using H to calculate y = z - H \* x', for radar measurements you'll have to use the equations that map from cartesian to polar coordinates: y = z – h(x').
* In C++, atan2() returns values between -pi and pi. When calculating phi in y = z - h(x) for radar measurements, the resulting angle phi in the y vector should be adjusted so that it is between -pi and pi. The Kalman filter is expecting small angle values between the range -pi and pi.
* Before and while calculating the Jacobian matrix Hj, make sure your code avoids dividing by zero. For example, both the x and y values might be zero or px\*px + py\*py might be close to zero. What should be done in those cases?
* Test! We're giving you the ability to visualize your estimations and calculate RMSE. As you make changes, keep testing your algorithm!
* For the fun of it, try removing radar or lidar data from the filter. Observe how your estimations change when running against a single sensor type! Do the results make sense given what you know about the nature of radar and lidar data?