

FURB_Meter

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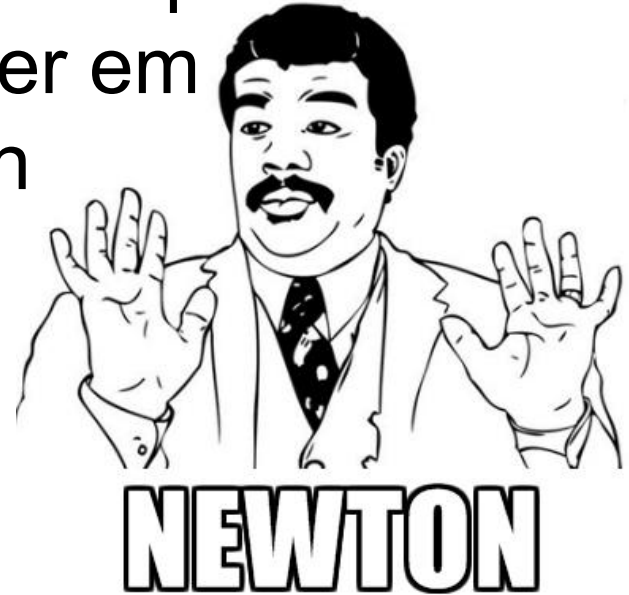
Objetivo

Desenvolver um aplicativo que calcula a altura de um objeto utilizando o giroscópio e a câmera do iPad.



Giroscópio

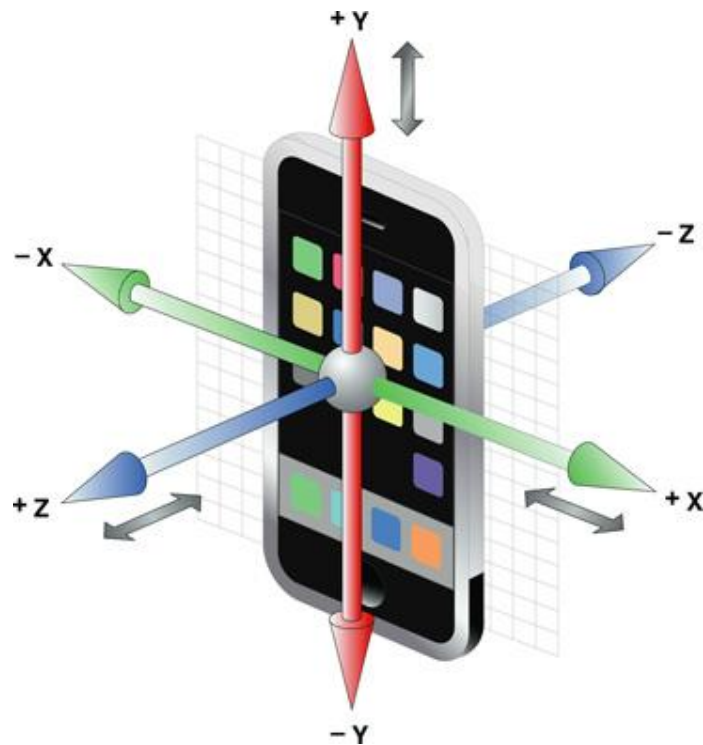
"Um corpo em repouso tende a permanecer em repouso, e um corpo em movimento tende a permanecer em movimento." - 1ª lei de Newton



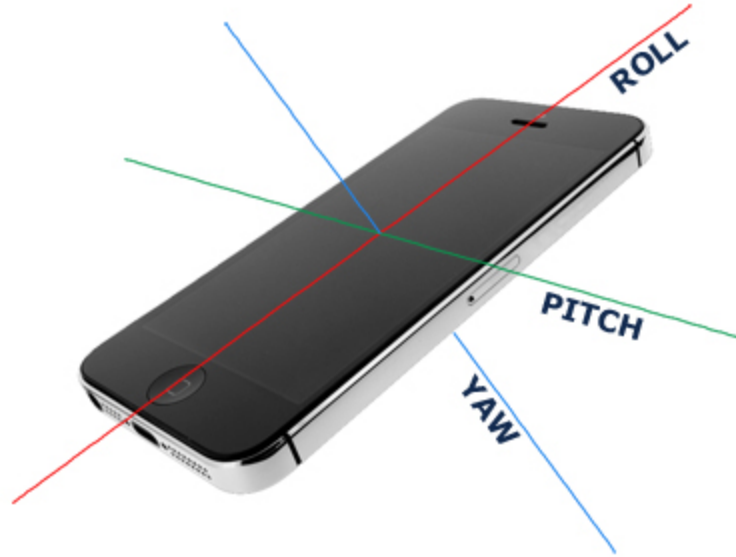
Giroscópio



Giroscópio



Giroscópio



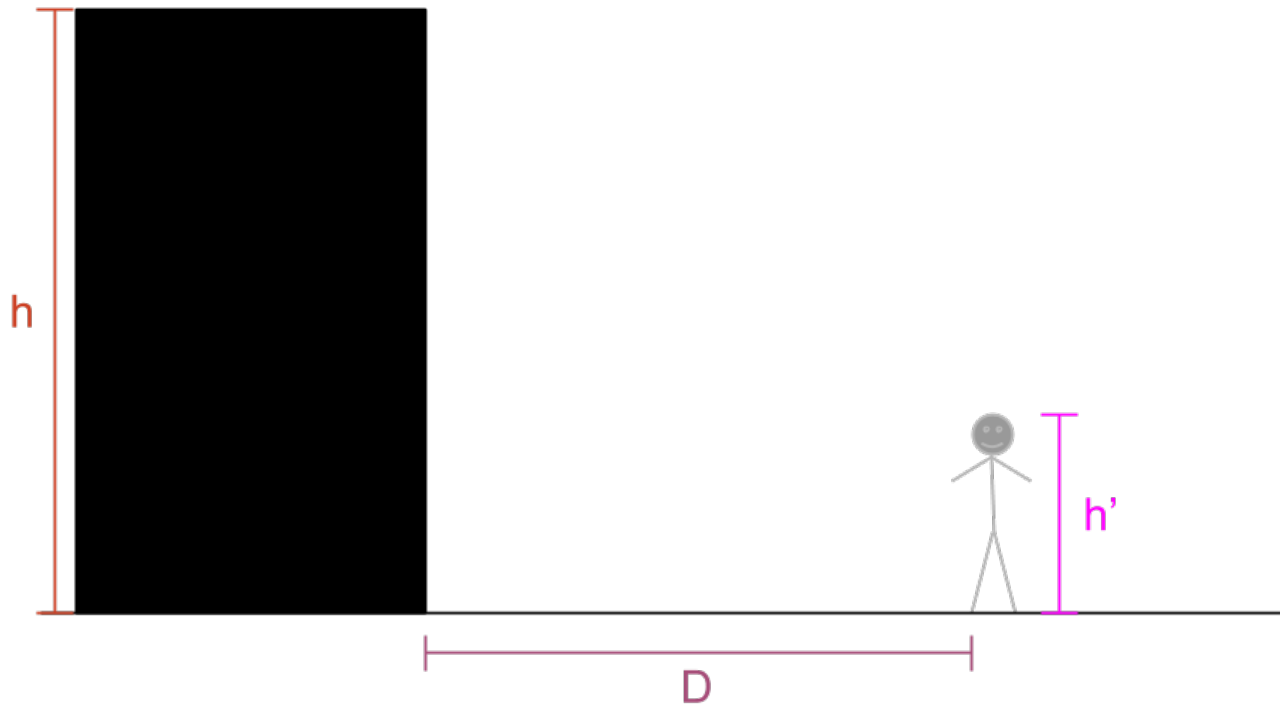
Trigonometria



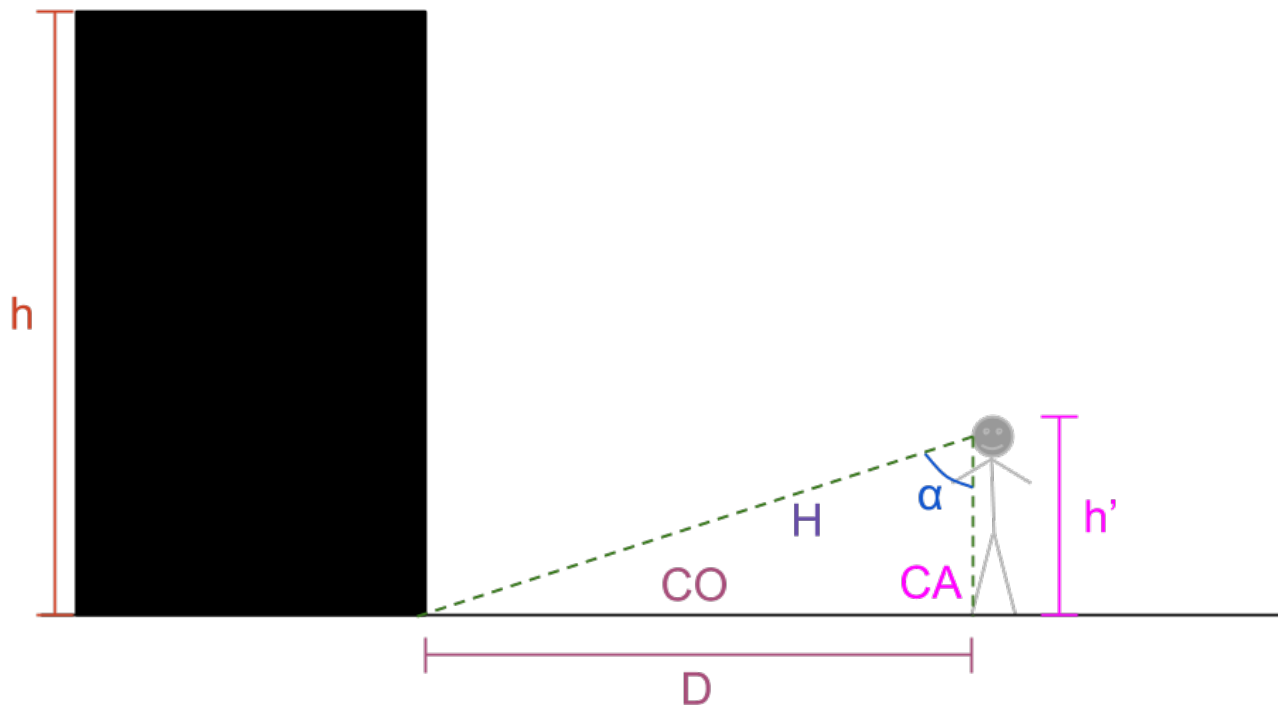
Trigonometria

$$\operatorname{tg}(\alpha) = \frac{\text{CO}}{\text{CA}}$$

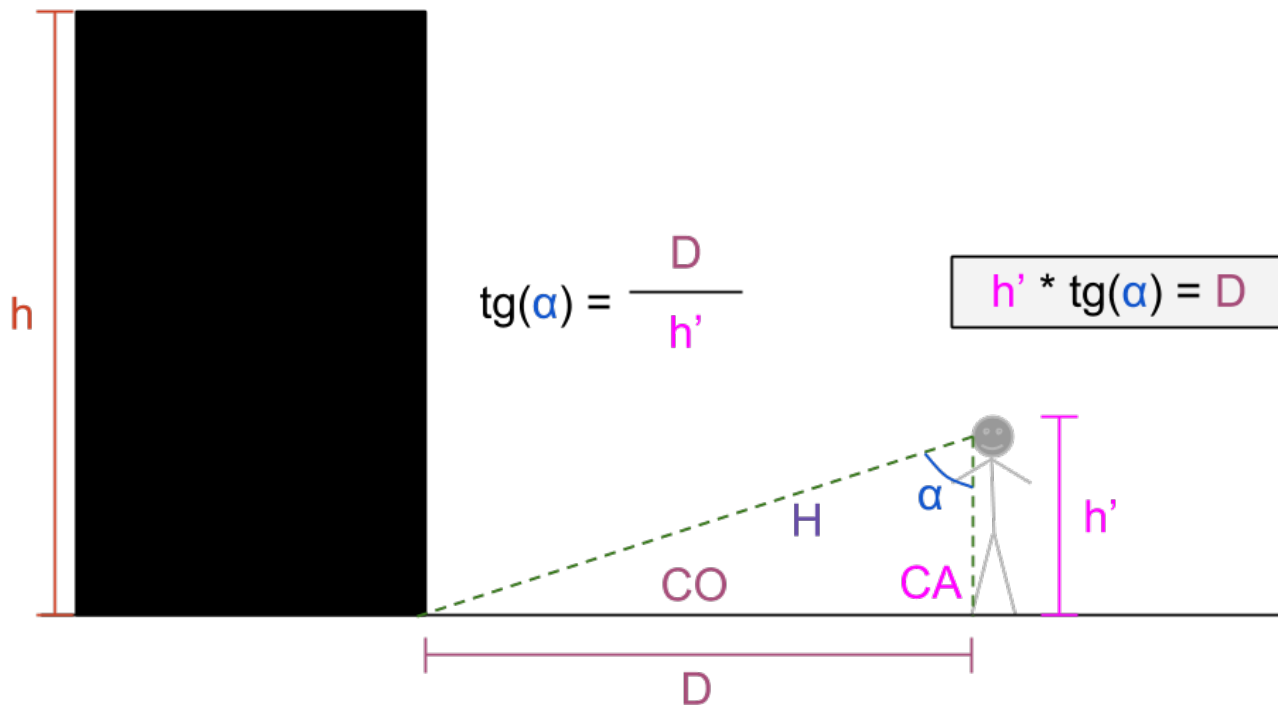
Trigonometria - Distância



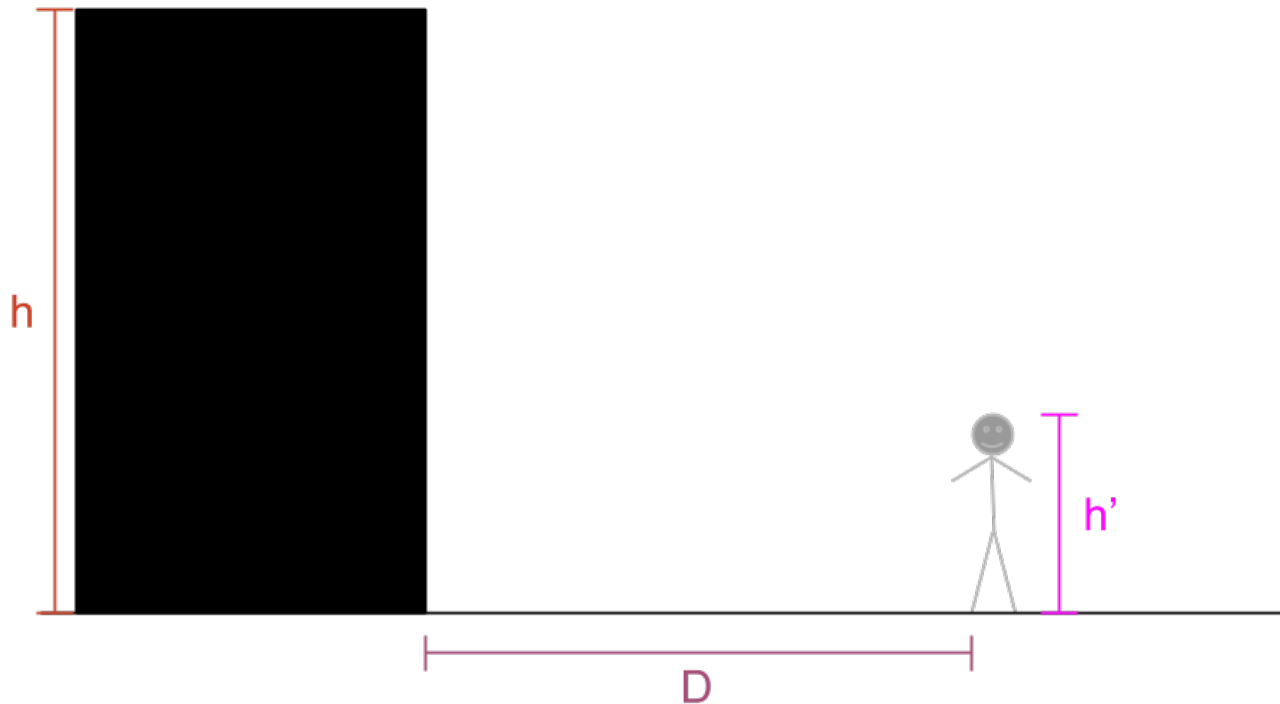
Trigonometria - Distância



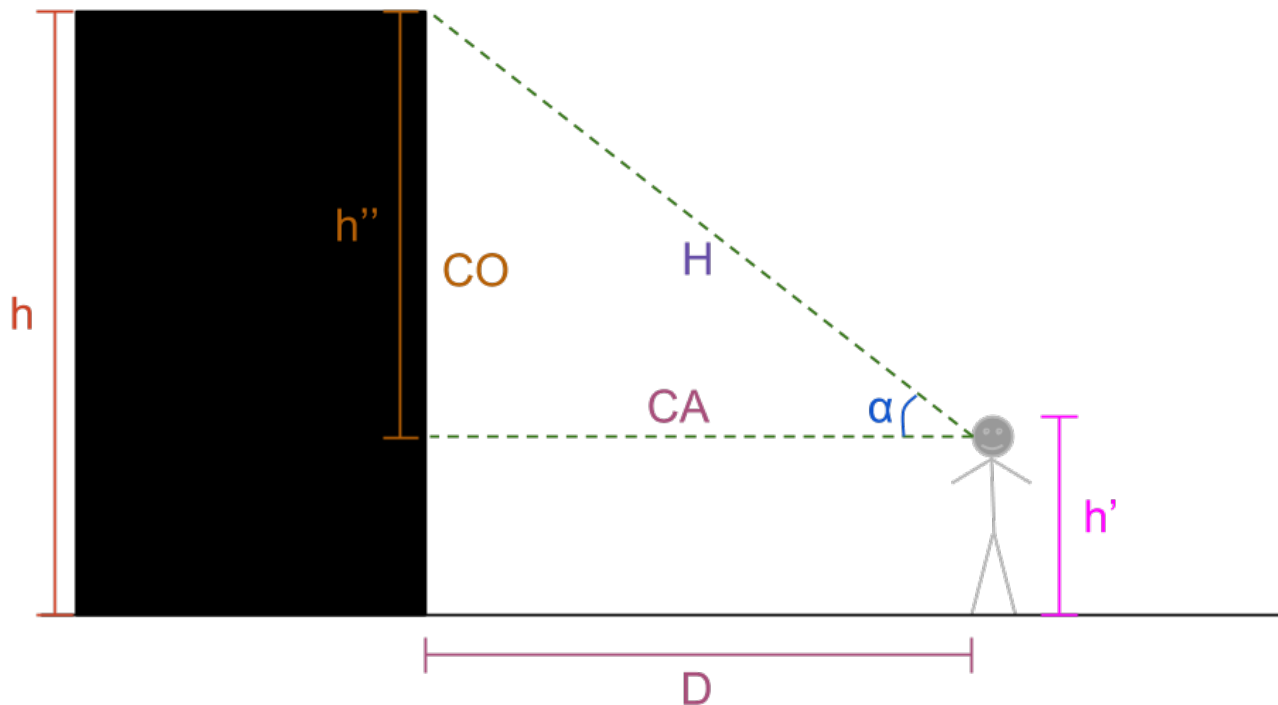
Trigonometria - Distância



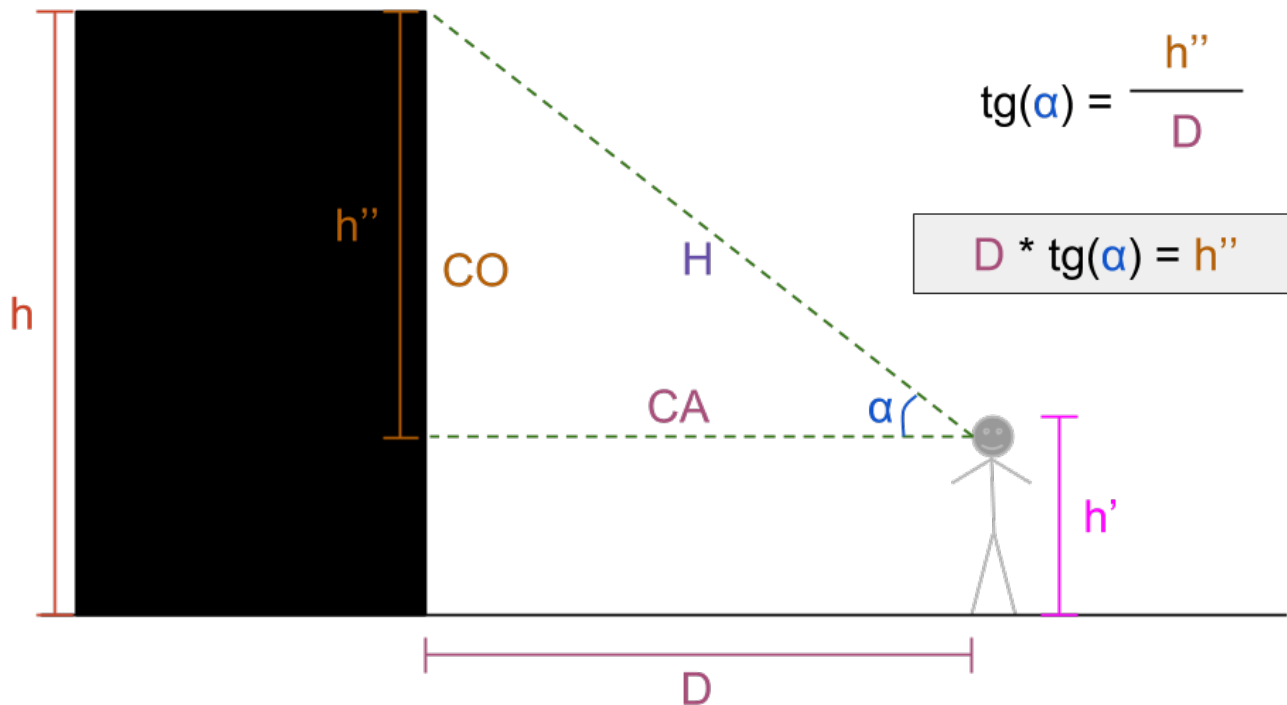
Trigonometria - Altura



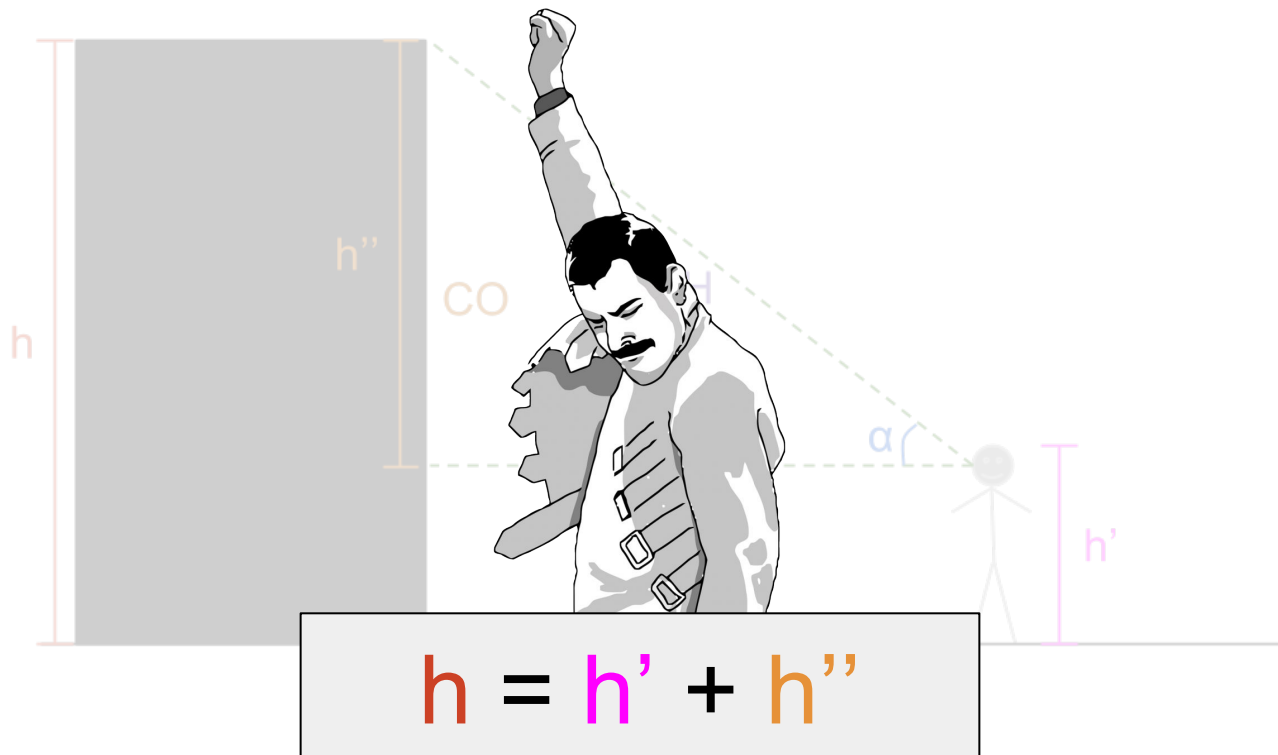
Trigonometria - Altura



Trigonometria - Altura



Trigonometria - Altura



CoreMotion

```
CMMotionManager* motionManager = [[CMMotionManager alloc] init];  
motionManager.accelerometerUpdateInterval = 0.01f;  
motionManager.gyroUpdateInterval = 0.01f;  
motionManager.deviceMotionUpdateInterval = 0.01f;
```


CoreMotion

```
[motionManager startDeviceMotionUpdatesToQueue:[NSOperationQueue currentQueue]
              withHandler:^(CMDeviceMotion *motion, NSError *error) {
    double roll = motion.attitude.roll;
    double pitch = motion.attitude.pitch;
    double yaw = motion.attitude.yaw;
}];
```

MobileCoreServices

```
UIImagePickerController* imagePicker = [[UIImagePickerController alloc] init];  
imagePicker.sourceType = UIImagePickerControllerSourceTypeCamera;  
imagePicker.mediaTypes = @[(NSString *) kUTTypeImage];  
imagePicker.allowsEditing = NO;  
imagePicker.showsCameraControls = NO;
```

MobileCoreServices

```
UIView* overlayView = [[UIView alloc] initWithFrame:CGRectMake(0, 0, 320, 480)];  
overlayView.opaque = NO;  
overlayView.backgroundColor = [UIColor clearColor];
```

```
UIButton* buttonDistance = [[UIButton alloc] initWithFrame:CGRectMake(25,  
topDistance, 150, 23)];  
[buttonDistance setTitle:@"Calcular distância" forState:UIControlStateNormal];  
[buttonDistance addTarget:nil  
    action:@selector(onCalculateDistanceTouch)  
    forControlEvents:UIControlEventTouchUpInside];
```

```
[overlayView addSubview:buttonDistance];  
imagePicker.cameraOverlayView = overlayView;  
[self presentViewController:imagePicker animated:YES completion:nil];
```

Extensões

- Melhorar interface
- Calcular comprimento do objeto
- Permitir uso na vertical e horizontal



Demonstração