

# A Simple Scratch of Our Idea

## Backgrounds:

Aerial photography is a fascinating technology for videotaping players doing different kinds of sports such as cycling, surfing, skiing, hiking...

Although there are a lot of excellent sports camera available in the market (such as [gopro](#)). These devices usually require players to mount such cameras to a part of their body or their tools (such as hand bar of a mountain bike). Most of time, this method hardly provides a good view of players and their surroundings.

Aerial photography usually can provide an excellent view of players and surroundings. But obviously, not too much people can afford a professional aerial photography team to videotaping for them.

These days, manufacturer of toy helicopters make it possible to use our smart phones as a controller to control toy helicopters, which provide a potential way to videotaping sport players. But the problem is during sporting, it is hard or impossible for players to manually control the toy helicopter for videotaping themselves.

## Our solution:

We propose to automatically control the toy helicopters to tracking players for videotaping during sports via smart phones. Due to the embedded sensors in today's smart phone, it is possible to use sensors such as acceleration sensor, gyroscope and magnetoresistive sensor to automatically control toy helicopters. Through this way, players can easily acquire a good view of themselves and surroundings at an affordable price.

We want to develop this idea iteratively. Currently i plan to divide the whole idea into 4 phase:

### 1. 1-D following:

The starting position of the helicopter should be manually set.

We only need to use accelerometer to control the helicopter to perform an 1-D tracking (forward and backward)

## 2. 2-D following:

The starting position will also be manually set.

We take advantage of the magnetoresistive sensor to control the helicopter in an 2-D space (forward, backward, turn left, turn right)

## 3. 3-D following:

The starting position will also be manually set.

We use gyroscope to help implementing 3-D control (forward, backward, turn left, turn right, upward, downward)

## 4. Locking (tracking):

We can only call it tracking in this phase. But currently I'm not sure about the specific technique we are going to use in this phase.

We may use some localization tech or digital photo processing tech (such as human recognition) to ensure we don't lose the player while videotaping.

Hopefully we can complete the first three phase of this project. But even if we don't, every phase of this project can be considered a relatively complete simple project.

The 4th phase seems more challenging and I still need to do some literature study before doing that. We may work on that part even after this semester if we really interested in it and have finished the 1-3 phase successfully.