Systems Engineering @ Cal

Rubber Band Helicopters

This activity will allow the budding engineer to explore some fundamental engineering concepts while having fun!

With just a few every-day materials, you can build a helicopter from scratch...

Wind it up...

And watch it fly!

Instructions:
To Begin:
Bend a paper clip into an "L" shape.
Hold paper clip in place against a popsicle stick, and secure it with masking tape.
Fit the propeller onto the other end of the paper clip.
Trace and cut out a paper helicopter outline.
Tape the paper helicopter to the popsicle stick on the side opposite to the exposed paper clip.

Next:
Take a piece of rubber band, fold it in half, and tie the loose ends together in a knot. This part can get tricky, so be sure to ask for a demonstration if you need it!
Pulling on the loose ends of the loop will shrink the knot, and pulling the knot will make it bigger. The size of the loop is important for making the helicopter fly: try to find which size loop works best!
Attach the rubber band from the propeller hook to the paper clip, wind the propeller, and let it fly!

Credit: WYE_Lance, instructables.com.
http://www.instructables.com/id/Inexpensive-Rubberband-Powered-Helicopter/

Welcome to Cal Day!

Today is the day to explore what makes Berkeley great! One of the best engineering programs in the world, we have plenty of opportunities for undergraduate research, and this is just one of the products of our work.

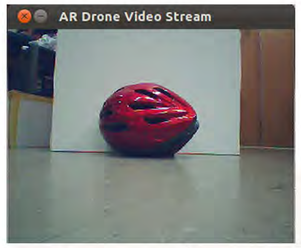
Here, you'll be able to control an AR Quadrocopter via a remote interface

And if you'd like, you can make a miniature helicopter of your own!

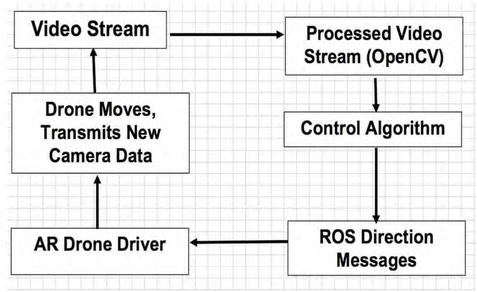
Feel free to explore the specifics of our research, and don't be shy! Ask questions. But most importantly, have fun!

Here's What We've Been Up To:

Our undergraduates have been working to use ROS (Robotic Operating System) and the AR Drone driver developed by Brown University in conjunction with OpenCV (open source C++ image processing library) to obtain video stream through the AR Drone, process the video, and use the results to control the AR Drone. The objective of the project is to make the AR Drone track and follow a red ball autonomously.



System Architecture:



How:
- Use programming language (which uses Python or C++ for actual coding).
- Researchers at Brown University developed a few experimental packages for controlling AR Drones. However they contained numerous bugs for our purposes, which the undergraduates at Berkeley had to fix.

Challenges:
- The controlling of the drone through the computer has been mastered. The only issues needing work is the stabilization when faced by natural obstacles such as wind.

Future work:
- Exploring image processing in the drone through the ROS libraries in that subject.