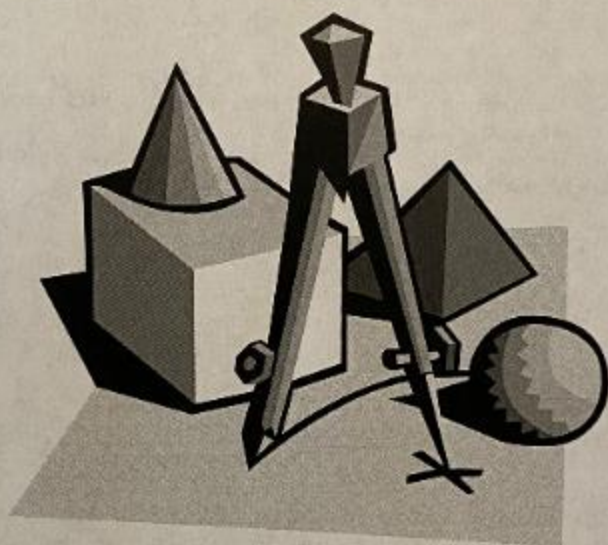


Engineering Design Notebook



Name Jerrin Kakkannatt
Project Title Prone Buddy
Contact Info. j.kakkannatt@gatech.edu

Rules for Keeping an Engineering Design Notebook

1. On the front of the notebook enter the project title, your name and other information needed to return the notebook to you in case it is lost.
2. Keep a table of contents at the front of the notebook.
3. All entries must be done in ink.
4. Design notebooks do not have to be neat but they must be legible.
 - a. Do not be obsessed with neatness at the expense of faithfully recording everything as it happens.
 - b. Do not crowd the materials on the pages.
5. Make your entries at the time you do the work.
 - a. Include all results and learned information whether favorable or unfavorable.
 - b. Include all information even if you do not fully understand it at the time of entry.
6. If you make errors, just cross them out with an X or a single line.
 - a. Do not mark through anything so that it can not be read.
7. Do not erase anything.
8. Never tear a page out of the notebook.
9. All data must be in their original form (calculations, charts, pictures, sketches on scrap paper, etc.), not after recalculation or transformation.
10. Rough drawings should be done directly in the notebook. More careful drawings such as machine drawings or computer-generated plots should be made and entered in the book.
11. Information on loose sheets of paper should be entered into the notebook by:
 - a. Taping the loose paper to the next available blank page in the notebook
 - b. Taping each corner of the loose paper
 - c. Use a tape that will accept ink permanently
 - d. Place your signature on the loose paper, continue across the tape and end on the design notebook page. Sign across each corner of the taped page. Date the signature.
12. Information that can be retrieved easily (such as research articles from journals) should not be entered into the notebook. Enter only the needed information and the location and the location of the information in case you must retrieve it again.
13. Title each page of the notebook and enter the information on the Table of Contents.
14. Sign and date the notebook page at the space provided at the bottom.
15. Have your design entries witnessed and have the witness sign and date at the space provided.
 - a. The witness needs to have the technical ability to understand the entry.
 - b. The work can be witnessed periodically.
16. Every page of the notebook must be numbered.
17. No pages should be skipped. This is a chronological record of your work.

A good engineering design notebook is one that can be used to reconstruct your work even years after you have completed the original project. Other engineers should be able to use the notebook to reconstruct your work. The notebook will be used to determine the rightful owner of patents and other proprietary ideas.

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Title of Activity

First Meeting

Title of Project

Drone Buddy

- First meet new term members
- discussed majors and areas of expertise
 - George → CompE
 - Harsh → CompE → app development
 - Zach → EE → machine learning
- most members have had prior experience with drone development
- I have no prior drone experience
- Harsh explains the gist of the project: build a drone to follow people on campus if they feel unsafe/uncomfortable
 - drone also records

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Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

Jon Kohn

Date 2/12/20

Title of Activity

Initial Ideas / Concerns

Title of Project

Drone Buddy

- How to go about identifying/recording threats
- what are the rules against recording and drone use on campus or in bearing?
- general use of drone
- cost?
- do we want more amendability in drone code?
- how to call in drone (app)?



- drone comes in through bluetooth and records perpetrator

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

Sam Kohn

Date 2/19/20

Title of Activity

Technical Review

Title of Project

Drone Buddy

- We discussed what topics everyone would do for the technical review paper
- I chose threat detection:
 - how to distinguish a threat from a user
 - download previously gathered data on threat movements into drone or
 - code drone to recognize threats in relation to the user and surroundings (i.e. the person using the app and the ground)
- We also decided on Dr. Hagler as project advisor because of her experience with drones

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Witnessed and Understood by

Zachary Mathews

Date

11/25/20

Recorded by

Jon Kels

Date

12/24/20

Title of Activity

Meeting with Project Advisor

Title of Project

Dron Buddy

- hard to get up a time when whole team could meet with Dr. Hasler
- after a few emails, found a time to meet with for ~~Dr. Hasler~~ with Hasler
- discussed concerns about project:
 - battery life
 - weight
 - how to detect and distinguish people through sound and video
 - how to supply network connectivity with drone
- Dr. Hasler discussed possibly setting up charging stations around campus as drone battery life averages around 20 mins or so

Witnessed and Understood by

Zachary Mathews

Recorded by

m. kula

Continued on Page

Date 11/25/20

Date

3/6/20

Title of Activity

What we need

Title of Project

Dron Buddy

1. drone chassis
2. battery
3. flight controller

~~also~~

1. - the chassis generally needs to be lightweight
as a main concern
- also relatively weather proof
2. - the battery also needs to be lightweight
but hold decent charge
- trying to find the right balance of weight
and charge sufficient enough for project
is main concern
3. - decided we want a more programmable
controller to perform our very specific
tasks
- cost varies drastically so we need to
be wary of budget

Witnessed and Understood by

Zachary Mathews

Recorded by

M. Kilo

Continued on Page

Date 11/25/20

Date 3/18/20

Title of Activity

Zoom Meeting

Title of Project

Proton Buddp

- researched potential flight controllers, chassis, motors, and batteries

Chassis - DJI Trans Tec

Flight Controller - DJI N3

Motors - Parkerstar 1000KV 35 BDC

Battery - URUAV 35 Lipo 16000 mAh

- distributed roles for Project Proposal

Continued on Page

Witnessed and Understood by

Zachary Mathews

Recorded by

[Signature]

Date 11/25/20

Date 4/11/20

02/10

Title of Activity

Individual Research

Title of Project

Drone Buddy

- researched limits on our specs

- based on ~~our~~ the parts we decided to use, what is the min/max of each aspect

- ex. battery life
weight
camera resolution
etc.

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

mm mla

Date 4/15/20

Title of Activity

Project Proposal

Title of Project

Drone Buddy

- tabulated all major aspects of project and respective spec limitations
- distinguished leadership roles among the group based on skill and expertise
 - roles include for both 4011 and 4012

Continued on Page

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Zachary Matthews

Date

11/25/20

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[Signature]

Date

4/14/20

Title of Activity

Semester 2 First Meeting

Title of Project

Prone Buddy

- Who is in Atlanta?
 - everyone on campus except Harsh
- How to we adjust our timeline^s for the current situation?
- Proposal presentation ideas
 - need to discuss materials
 - need to discuss drone development with 1 remote team member
 - LiPO changed to LiIon
 - need speed controller

Continued on Page ____

Witnessed and Understood by

Zachary Mathews

Date

11/25/20

Recorded by

[Signature]

Date

~~11/25/20~~ 11/17/20

Title of Activity

Discussion of Proposal Meeting

Title of Project

Drone Daddy

- How in depth do we discuss our project?
- limited instructions and examples for presentation
- Parts changes:
 - swapped out DJI parts for Lumenier parts
 - parts need to run Beta Flight
 - Lumenier parts are cheaper and safer

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

[Signature]

Date ~~11/25/20~~ 8/19/20

Title of Activity Development of Proposal Presentation
Title of Project Drone Buddy

- Open CV discussion
- algorithms for motion detection
- how parts will use Beta Flight

Continued on Page _____

Witnessed and Understood by Zachary Mathews
Recorded by [Signature]

Date 11/25/20
Date 04/02/20 8/20/20

Title of Activity

Meeting with Project Advisor

Title of Project

Drone Buddy

15

- initial proposal is too long
- more technical data needed
- how will all the parts be put together and used specifically?
- pictures and graphs are important
- proposal needs to be approved before ordering parts
- can make a video instead of presenting

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

J. Mathews

Date

12/1/20 8/13/20

Title of Activity Project Proposal Revisions
Title of Project Drone Buddy

- found evidence for increased on-campus crime (nces.ed.gov)
- less discussion of individual parts
- more discussion on part cohesion
- more discussion of DeltaFlight uses

Continued on Page _____

Witnessed and Understood by Zachary Mathews Date 11/25/20

Recorded by [Signature] Date ~~10/20/20~~ 9/1/20

Title of Activity Additional Proposal Presentation Revisions
Title of Project Drone Buddy

- more focus on big picture
- more pictures / graphs
- how exactly parts fit on drone frame
- individual part information is not as important

Continued on Page _____

Witnessed and Understood by Zachary Mathews

Date 11/25/20

Recorded by [Signature]

Date ~~12/22/20~~ 9/9/20

Title of Activity

Proposal Presentation Video Recording

Title of Project

Drone Buddy

- split slides up among team members
- talking points of motion tracking and Beta Flight
- how surveillance server will work
- uses of the mobile app

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Witnessed and Understood by

Zachary Matthews

Date

11/25/20

Recorded by

[Signature]

Date

~~11/25/20~~ 9/16/20

Title of Activity Meeting to Discuss Purchasing Parts
 Title of Project Drone Buddy

- ~~for the~~ what specific parts do we need
- what can Harsh do outside of campus
- how much will it cost and how many should we get of each part (~\$600)
- I am financial manager
- order parts and save receipts
- Harsh will work on flight controller, and LTB module, GPS module, and camera
- we will work on all parts separately, see ~~for~~ who ends with best result

Continued on Page _____

Witnessed and Understood by

Zachary MathewsDate 11/25/20

Recorded by

[Signature]

Date

12/16/20 9/22/20

Title of Activity

Ordering Parts

Title of Project

Dron Duddy

- I ordered a complete set of parts for us in Atlanta
- Harsh ordered his parts
- need to test parts to see if any parts need to be replaced or changed

Continued on Page ____

Witnessed and Understood by

Zachary MathewsDate 11/25/20

Recorded by

[Signature]Date ~~10/15/20~~ 9/25/20

18 21

Title of Activity

Team Status Meeting

Title of Project

Drone Buddy

- could not meet as I was back home
- received main points from team members
- need a 7 week plan
- discuss full scope and exactly how the app will work with Dr. Hasler
 - app will use GPS location
- need to meet and assemble drone frame
- after assembly, test flight and part usability

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

[Signature]

Date

~~10/21/20~~ 10/21/20

Title of Activity

First Lab Meeting

Title of Project

Drone Buddy

- Me, George, Zach meet to put together drone
- Drone Chassis gets built
- need new motors
- battery might be too big?
- board needs to be soldered
- still waiting on gps to be delivered

To-Do

A [X] buy new motors 10/12

Continued on Page _____

Witnessed and Understood by Zachary MathewsDate 11/25/20Recorded by [Signature]Date 10/12/20

Title of Activity

Team Check-up Meeting

Title of Project

Drone Buddy

~~me and Harsh~~
 - me and Harsh met to ~~see~~ see
 where both ~~are~~ ~~are~~ he and
 the group still in Atlanta are
 doing

- Harsh is developing the app

To-do

- Zach got a remote

☒ put the drone fully together so
 we can test

☒ can beta flight

☒ get remote for testing the drone

☒ register for Expo

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date 11/25/20

Recorded by

for *for*

Date 10/14/20

Title of Activity Team Meeting
 Title of Project Drone Buddy

- me, Haresh, Zach, and George meet
- chassis is built
- an - Haresh is working on web socket interface
- waiting on GPS in the mail

to-do

☒ still need to solder

☒ need to get GPS and test

☒ test if LTE works

Continued on Page _____

Witnessed and Understood by Zachary Mathews
 Recorded by [Signature]

Date 11/25/20

Date 10/20/20

Title of Activity

Lab Meetings

Title of Project

Drone Buddy

- Me, George, and Zach meet to work on Drone in lab

- soldered wires

- need to get motors working

~~A~~ - waiting on receiver
to do

☒ test GPS

☒ figure out how to mount the camera and GPS

☒ get ZTE LTE modem to work

☒ get drone to fly

Continued on Page _____

Witnessed and Understood by

Zachary MathewsDate 11/25/20

Recorded by

[Signature]Date 10/24/20

Title of Activity

Lab Meeting

Title of Project

Drone Buddy

- Me, George, and Zach meet to finish up drone

- got all parts on chassis except receiver, camera, and gps

To-do

☒ design receiver, raspberry pi, and camera mounts

☒ make sure mounts fit the drone

☒ 3d print mounts

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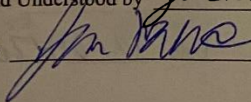
Witnessed and Understood by

Zachary Mathews

Date

11/25/20

Recorded by



Date

11/4/20

Title of Activity 3d Print GPS Mount
 Title of Project Drone Buddy

- go to Invention Studio to 3d print mount
- adjust design to fit drone
- had to redesign to fit screw holes

To-do

- ☒ need ^{new} ~~to~~ mount; current one is too big
- ☒ redesign and print again at Invention Studio
- ☒ reprint because printer failed

Continued on Page _____

Witnessed and Understood by Zachary Mathews
 Recorded by Jm [Signature]

Date 11/25/20

Date 11/10/20

Title of Activity Drone Testing
 Title of Project Drone Buddy

11/19	- Me and Zach set go to Piedmont Park to test Drone flight
	- drone flies but gpu functionality has some issues
	<u>to-do</u>
	☒ figure out throttle and which needs to age
	☐ make some new GPS marks
11/21/20	- Me and Zach test drone again
	- crashed a few times
	- magnetometer doesn't work
	<u>to-do</u> - flight controller is broken
	☒ need to figure out GPS issues
	☒ figure out the substitute for working magnetometer
	☐ finish poster
	☒ get data even though flight controller is broken

Continued on Page _____

Witnessed and Understood by Zachary Mathews
 Recorded by [Signature]

Date 11/25/20
 Date 11/19/20 + 11/21/20

Title of Activity Team Meetings
Title of Project Drone Buddy

- Me, Zach, George, and Haush meet

- need to make and practice presentation

To-do

☒ finish drone testing

☒ work on and practice presentation

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Recorded by

[Signature]

Date

11/25/20

Date

11/20/20

Title of Activity

Final Team Meeting

Title of Project

Prose Buddy

- met with Zach, George, and Darsh
- need plan B because flight controller is busted
- we can share working GPS data

or

To-do

- ☒ work finish presentation and video
- ☒ practice presentation
- ☒ add more technical details for Expo
- ☒ record and upload video

Continued on Page _____

Witnessed and Understood by

Zachary Mathews

Date

11/25/20

Recorded by



Date

11/29/20