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From: Beer per Day

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Summary

All the team members make individual today's plans related to the project

- For development, analyze the Android SDK, simulator, and so on
- Write down the Abstract, Introduction, and Related Works in paper
- Find drone TSPI datasets

What Beer per Day was completed this week

- **Make an algorithm pseudo code for Linear Regression like paper style**

Algorithm 1 Linear Regression

```
procedure getBeta(X, y, k, positions, velocities, angles)
    for i = 0 →X.length−k do
        X_i ← positions_{i..i+k}
        X_i.append(velocities_{i+k}, angles_{i+k})
        X_i ← X_i^T
    end for

    X ← X.reshape(X.length/(k + 2), k + 2)
    beta ← (X^T ∘ X)^{-1} ∘ X^T ∘ y

    return beta
end procedure
```

Algorithm 2 Predicting and Moving Next Position

```
Require: beta
procedure getX(k)
    X ← []
    while X.length < k do
        newData ← getData()
        X.append(newData)
    end while
    X.append(velocity)
    X.append(angle)
    return X
end procedure

procedure PREDICT(distance, D, k) abstract Thread
    X ← getX(k)
    if distance > D then
        drone.move(X ∘ beta)
    end if
end procedure
```

- **Analysis function and variables in DJI Android SDK v4**
  1. Find a method that gets coordinates locations
     - Android SDK (version 4.16.4) has onAttachedToWindow function in WaypointMisson-OperatorView
     - This function has how to get coordinates from a connected drone (interval time is 10 sec)
     - Try to change less interval time in this function
     - Try to change this function to an async function
  2. *Latitude, Longitude* value has *"HOME_LOCATION"*
  3. WaypointMissonFinishedAction
     - GO_HOME: If an aircraft is near HOME in 20m, it lands, or not it goes back to home
     - NORMAL: It doesn't make a curve to go to the waypoint
     - SAFELY: Match the aircraft's altitude with the waypoint altitude
     - WaypointAction: This class is executed when the aircraft arrived at the waypoint

4. View (if view equals bottom items, drone doing something)
    - R.id.btn_simulator: Starting simulator
    - R.id.btn_load: Loading method / Fetch missions and check it has an error
    - R.id.btn_upload: Upload mission to operator
    - R.id.btn_start: If already mission is up to date, it starts that mission
    - R.id.btn_stop: An aircraft stop the mission
    - R.id.btn_pause: An aircraft pause the mission
    - R.id.btn_resume: An aircraft resume the mission
5. Conclusion
    - Get TSPI by a relative coordinate of the takeoff location
    - GetVelocity x, y, z give current speed in an aircraft
    - Listener: If the product has sensors that reflect changes, it shows a great option
    - Callback: Basically, the callback runs every 10 sec
    - Thread: Need to use callback function as using Android Studio

- **The others about developing**
    1. Launch the DJI drone simulator
    2. Download the drone TSPI dataset

- **Write and Review the paper**
    1. Abstract, Introduction, and Related Works
    2. Minji Lee reviewed the paper, and we modified

- **Make slides for midterm presentation.**
    1. Minji Lee reviewed the slides, and we modified

Things to do by next week

- Until Wednesday, prepare for the midterm presentation
- Make drone datasets from the simulator
- Verify Machine Learning or Deep Learning code from datasets

Problems or challenges

- Can’t convert .DAT file to .csv file
- Can’t get TSPI from drone every time