

GSoC 2023 Final Report Submission



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Project: Agro Robot Control App (ARCA)

Organization: Liquid Galaxy

Description

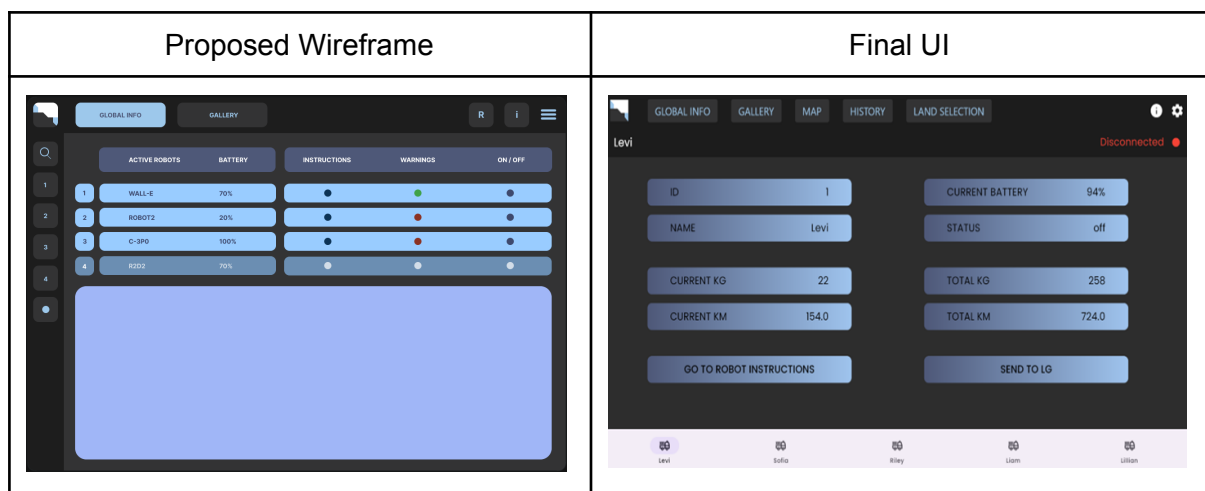
ARCA is a dashboard android application that allows farmers to have a better control of their lands with its robots and send the information desired to the Liquid Galaxy rig.

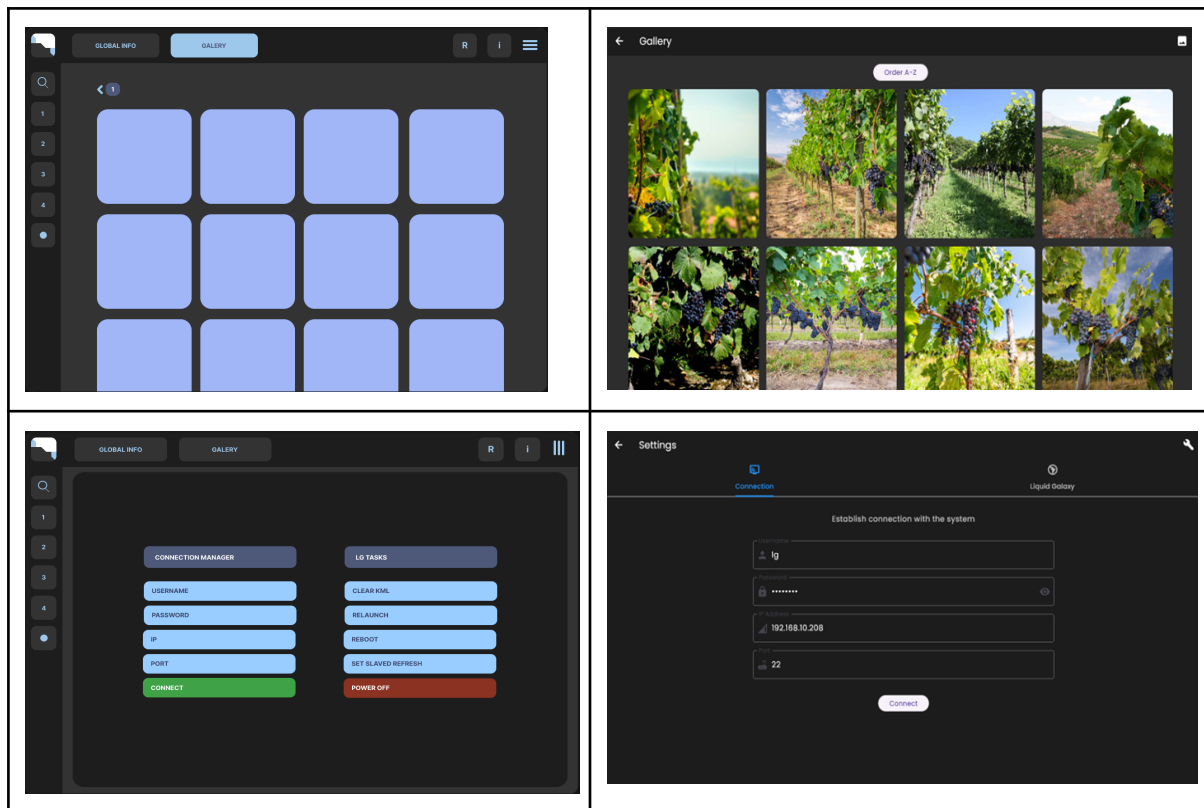
This application has different objectives, first of all, to collect information about all the robots displayed on a field, like its battery level, the kg they are carrying, the km they have done... Also, if the robots are equipped with cameras, you are going to be able to see images taken from the robots and see the progress of your trees or fruit.

Another of the objectives of ARCA was to have a map where the farmer is able to see its land on the tablet and once it is connected with the Liquid Galaxy, use the tablet as a controller of the Google Earth and see the robots path on the rig.

Worked on:

- Making all the robot information using a python script.
- Making the kmls of all the lands we want to load.
- Making the kmls of all the robot paths on each land.
- Look for all the images shown.
- Treating all the data.
- Installation of a 5 and 3 screens liquid galaxy.
- Creation of the application interface and logic.
- Treat all the kmls and understand how they work.
- SSH connection between the tablet and the Liquid Galaxy with Flutter.
- Shared Preferences of the configuration settings.
- Integrated Google Map and many functions to control Liquid Galaxy.





Work done by week

Week 1 (May 29 – June 4)

- Installing OS for docker for AI server
- Installing Liquid Galaxy

Week 2 (June 5 – June 11)

- Installing Liquid Galaxy

Week 3 (June 12 – June 18)

- Modified screens for UI
- Appbar and bottom navbar
- Organization of the files of the app

Week 4 (June 19 – June 25)

- Modified screens for UI
- Appbar and bottom navbar
- Organization of the files of the app
- Isar database
- Better navigability between pages

Week 5 (June 26 – July 2)

- Increment robot button for adding robots
- Global info screen done
- Better organization of the code
- Errors with listview
- Change splash screen
- Added map and calendar button
- Gallery done (with no images)
- Settings page and ssh connection

Week 6 (July 3 – July 9)

- Created mocked robots
- Created CSV reader for the data
- Connection with Liquid Galaxy
- Commands sent properly

Week 7 (July 10 – July 16)

- Created robot data from csv
- Gallery images done with all the images
- Issues resolved
- Modified robot data and created land data
- Mocked land info for read data properly

Week 8 (July 17 – July 23)

- Data persistence implemented
- All land data uploaded with its value
- Solving problems

Week 9 (July 24 – July 30)

- Markers implemented on map screen
- Modify all perimeter and path kml of all the lands and robots
- Make a reader of all the kml and assign to its value in mocked object
- Initialize all the info at the beginning of the app

Week 10 (July 31 – August 6)

- Assign each perimeter and path to its land
- Making the info kml to send to Liquid Galaxy rig
- Improve the UI of the kml
- Images sent to LG
- Make perimeter and path for the map

Week 11 (August 7– August 13)

- Try to send coordinates of the selected land to the LG, lookat and tour working
- Make the tablet a controller of the Earth.
- Put markers on the tablet with their coordinates.
- Send the makers, perimeter and path to the LG
- Make orbit of a land

Week 12 (August 14 – August 20)

- Make the markers moveable at the Liquid Galaxy following the path
- Modify some screens and UI

Videos

- Midterm video:
https://drive.google.com/file/d/1t2MqqARdYGqvHTgc240twDp_8_yLgVEB/view?usp=drive_link
- Final video:
https://drive.google.com/file/d/13qVQnUb39rMcyG5fGc6hZj_ud7XJgM4F/view?usp=drive_link

My Experience

I'm truly excited to have had the incredible opportunity to take part in the Google Summer of Code 2023. During this program, I had the privilege of joining forces with the Agro Robot Control App.

Guided by Victor Carreras, a Flutter developer, and the opportunity provided by Andreu Ibáñez.

I garnered invaluable insights into the world of software development, experiencing remarkable personal growth within this concise timeframe, as it was the very first android project I faced.

Involvement in programs such as Google Summer of Code presents an unmatched chance to accumulate a wealth of experiential insights that remains unparalleled in any other context.

Links

- Github repository:

<https://github.com/Arturito01/AgroRobotSwarm-dashboard>

You will see a readme file with instructions for the installation.

- Some APK versions of the project:

https://drive.google.com/drive/folders/1SMo-PXQVirCFU2HtXQDXrXDnt11seEjM?usp=drive_link

- Worklog:

https://docs.google.com/spreadsheets/d/1zbGSyWhZeCukPf69FubrDrPZa1m3Govqu0tfmw73eVc/edit?usp=drive_link

Acknowledgement

I gratefully acknowledge the guidance of my mentors: Victor Carreras and Andreu Ibañez for always helping me throughout this GSoC period and android development in general.

Also thanks to Alejandro Illan Marcos for publishing the app in the Play Store

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