

# ZONDA IITA SALTA

## JOAQUÍN ARGAÑARAZ

• He has taken part in RCJ 2019, in Rescue Line, and in many editions of the national competition called Roboliga, which takes place in Argentina every year.

## JOAQUÍN RODRÍGUEZ

• Joaquín A. and Joaquín R. formed Zonda IITA Salta to take part in Roboliga 2022, in Rescue Line. They got a first place, which allows them to be competing in RCJ 2023 - Rescue Line.

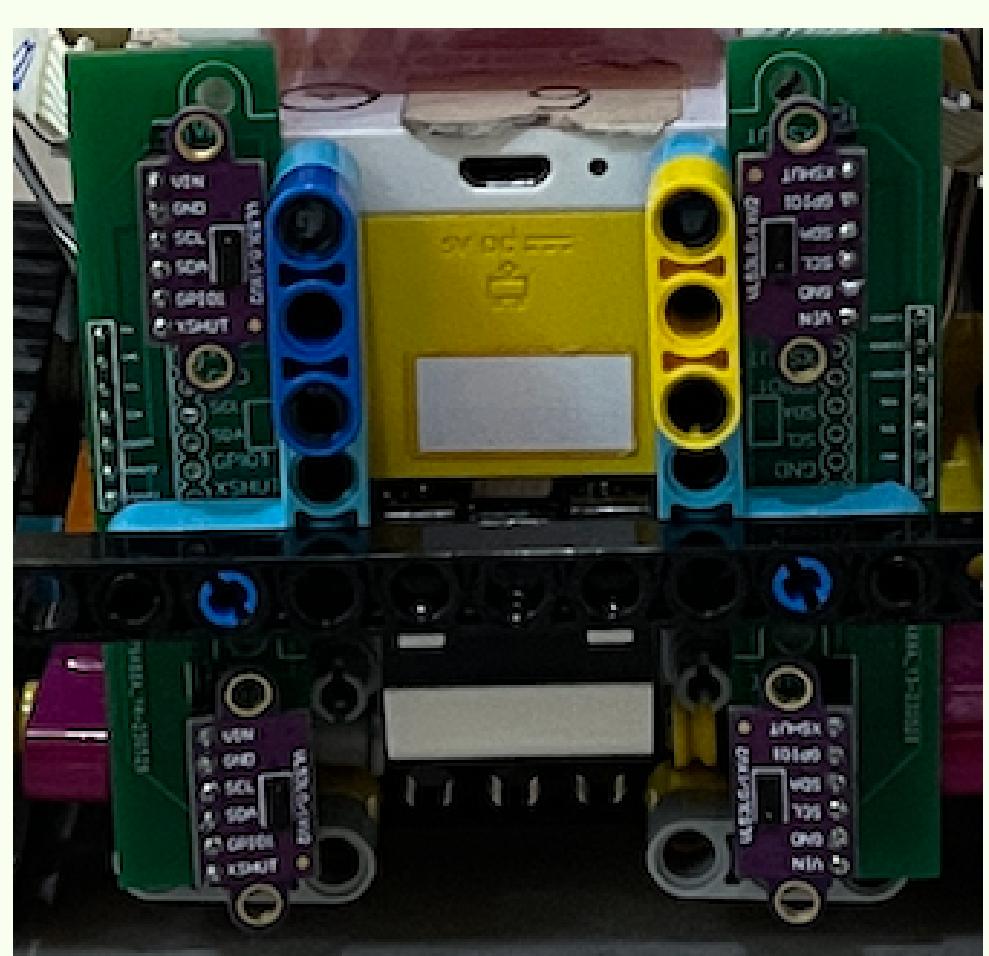
HEY FELLOW ROBOCUPERS!! We are excited for you to see our project! We would like to clarify that **OUR CODES ARE OPEN SOURCE** and that we are open to any doubts, questions or comments! We strongly believe in sharing and growing all together, so we hope you can learn from us!!

## ELECTRONICS

The electronic connections were necessary because, even though we are working with Lego Spike, we integrated an Arduino Nano, aiming for it to work simultaneously and in constant connection with the Lego Spike. Therefore, electronic connections between them both were needed.

## BOARDS

In order to establish a clean connection between the Lego Spike and the Arduino Nano, designing boards to organize cables was, for sure, the cleverest idea. This allows us to keep our robot always tidy and avoids too many unsafely connected cables which are likely to disconnect or make false contact, cause several critical problems. There is one board that holds the Arduino and allows it to communicate with the Lego, and another two boards that hold Time of Flight sensors

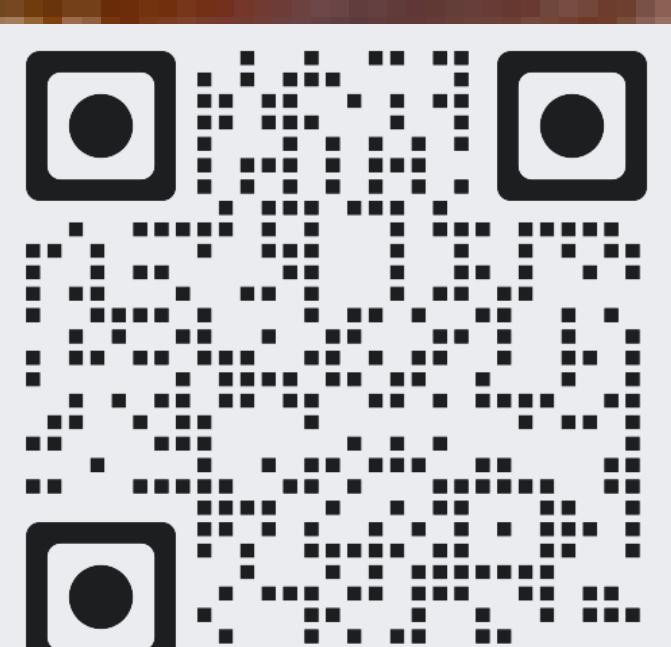


## PID

We implemented PID controller in the line-following part of the task, so as to make it as reliable as possible. Despite being something quite old in the world, it's incredibly new in Argentina and it is the first time an Argentinian team uses PID for this.



[GitHub Repo](#)

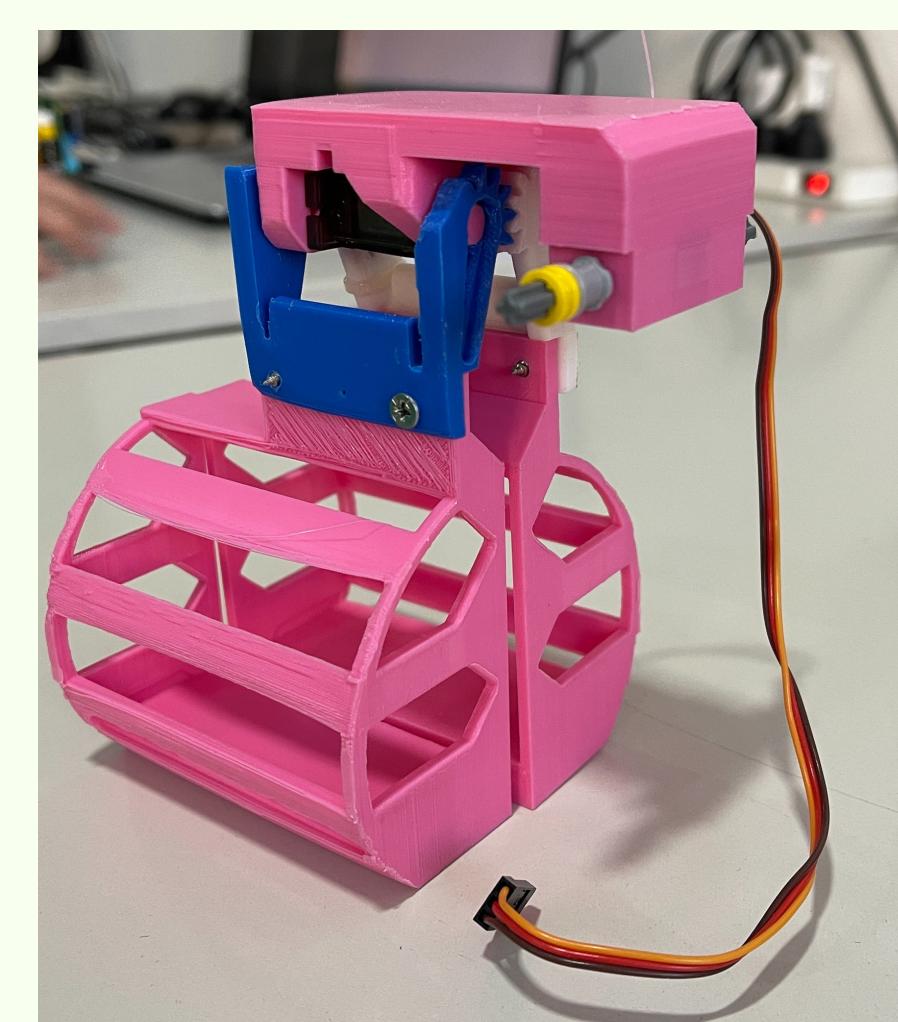


[Contact us!](#)



## 3D DESIGNS

As we are using both Arduino and Lego sensors, it was necessary to integrate both types of sensors to the main structure. Lego sensors are easy, but not Arduino ones. Many 3D pieces were designed in order to make Arduino and Arduino pieces look almost as Lego ones! Therefore, these 3D Pieces fit perfectly in Lego pieces and vice versa, making the robot one tidy piece of tech!



## RESCUE AREA

To rescue the victims, we are using Time-of-Flight sensors, which are located at the lower part of the robot. Our 'Bicho' enters the rescue area, deposits the rescue kit in the green corner and automatically starts looking for victims. It stands on different spots of the scenario and starts turning left and right looking for victims. When it finds one, it picks it up and goes to the correspondent corner.

## STRUCTURE AND COMPONENTS

The robot has both Lego and Arduino parts. The Lego pieces are the ones that come with the Lego Spike Prime Robotics Kit. However, Arduino pieces are much interesting. We implemented 4 Time-of-Flight sensors connected to an Arduino Nano. To control de claw, we are using a Mini Digital Servo and a Standard servo. If you want to check them out, feel free to scan the QR Code below!!



## SPIKE - ARDUINO COMMUNICATION PROTOCOL

The main point of our project is the Lego Spike Prime - Arduino Nano Communication Protocol we established between these two completely different boards. There was no information about this on the internet, so we decided to come up with a solution of our own! This Lego-Arduino communication is possible because of a Lego Cable that connects to the Lego on one side and to the Arduino on the other side. Of course, this cable is a sensor cable that has been cut and modified so that it can be connected to Arduino! If you want to learn more, scan de QR Code or contact us! We are excited for you to test this!