**Kauan:**

Good afternoon, my name is Kauan dos Santos and today I’m here to present to you Kyntact, the project I’m developing with my partners Miguel Yudi and Nicolas Sinelli as our final project for Etec da Zona Leste.

But before that I want to ask you something. Did you ever imagine going into any kind of public space and not being able to see the informations around you? It could be the price of a product, a sign or any kind of visual information. It can sound unreal, but it’s the reality of millions of people, so much that, according to IBGE, 3.2% of Brazil’s population suffer with visual deficiency, and like G1 points out, they face many challenges in getting around, especially in big cities.

To help these people we thought of Kyntact, a project that consists of an IoT system that’s able to capture images of the environment it is in, identify if there’s any text present in the images and write these texts in braille, turning any visual information into text easily accessible to them.

**Nino:**

With this idea in mind, the first thing we did was to define the project’s objectives. Its general objective is to create an IoT system capable of helping people with visual deficiency to comprehend texts surrounding them, using character recognition and electronic components, in order to create an accessible solution, and its specific objectives are creating a device able to write texts in braille, implementing a system capable of identifying and interpreting texts and writing any of the detected texts in braille.

Thinking about the purpose of the project, we decided to follow a qualitative methodology, that according to Marconi and Lakatos, the authors of a book about this topic, is a methodology that develops a solution based on a deep analysis of the user's experience.

After our research was done, we started developing our UML diagrams, which according to Guedes, is a modeling language with an objective to help in the definition of a system’s characteristics before its development. The main diagrams are Use Case, Component, Sequence, Activity and State Machine diagrams.

The system has two main parts: the first consists of a Raspberry Pi 4 that we programmed using Python, which according to the Python Software Foundation is a language with an intuitive syntax and functionalities like reusable modules, and also some of the many libraries it offers to help on the process of OCR, that allows images to be analyzed, converted and transformed digitally, in order to make it able to interpret almost any kind of text. The main libraries we used in the project are OpenCV, which is capable of detecting and treating images while applying filters, improving their quality, and EasyOCR, that is able to recognize texts in images.

**Miguel:**

The second part consists of an IoT device capable of writing texts in Braille, that is a language used by blind people to write using a group of 6 points distributed in two equal columns. The device is controlled by an ESP8266, that is a micro controller made by Espressif, was programmed using C++, a language based on C, that was created with the proposal of making an eficient way of managing complex programs and has multiple usages, according to Schildt, and uses solenoids push and pull to write the text in braille, which is a component that, when energized, raises a metal rod. It also contains a push and pull button that is used by the user to confirm the reading of the recognized text.

We can have an ideia of how the system looks like with this 3D model our group made to crudely represent the system.

It’s important to say that, until this moment, we have the device capable of translating text to braille, but that has to stay plugged to electric outlet in order to work, but in the future, besides improving on what we already have, to make the device portable and improve its funcionalities, with the final goal to make it usable in any public space.

Finally I want to thank you all very much for the attention and if you have any questions feel free to ask us.