FIKALAB

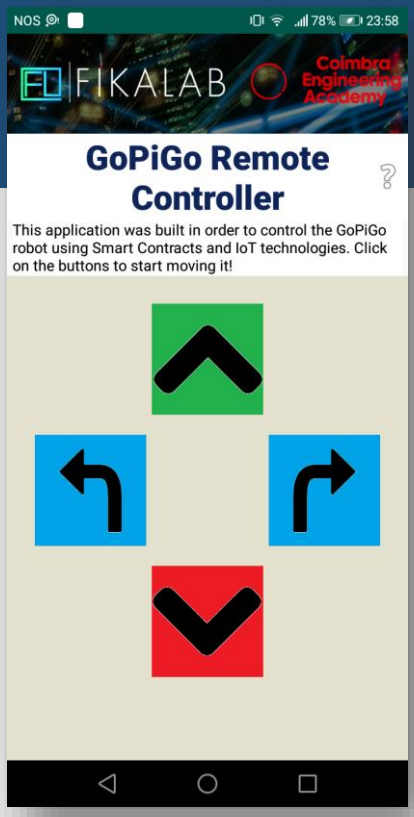
ISEC 2019

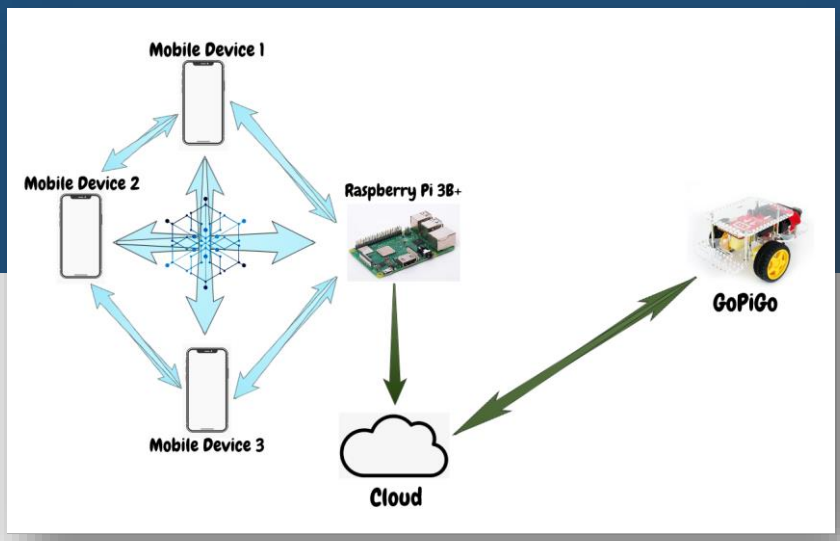
So you want to enjoy Blockchain's advantages, but you require an IoT? We have the perfect architecture for you!

Blockchain Benefits
- ✔ Security
- ✔ Immutability
- ✔ Auditability

+

Cloud Benefits
- "Infinite" storage ✔
- "Infinite" processing power ✔
- Scalability ✔





Members
- Tiago Ferreira – Project Manager
- Luís Silvestre – Blockchain Developer
- Rodrigo Rafael – Software Developer

Blockchain for IoT: a Smart Contracts Approach

Ok, so what is this?

This is a *proof of concept* for a management system that requires the manipulation of various devices or objects from different entities, using blockchain and Internet of Things.

Things used in this project:

Devices

- Android devices
- Rapberry Pi 3B+, a credit card sized single board computer with Wi-Fi
- GoPiGo, a robot car that works with the help of a Raspberry Pi

Blockchain Technologies

- Ethereum, a blockchain platform that allows for the development and execution of Smart Contracts
- Infura, a service that provides online nodes on the Ethereum networks, allowing connected devices to interact with the blockchain without the need of having a full copy of the network
- Smart Contracts are programmable contracts that run on the Blockchain. They run on the Ethereum Virtual Machine and allow the creation of Decentralized Applications on Blockchain network, also known as DApps

Cloud Technologies

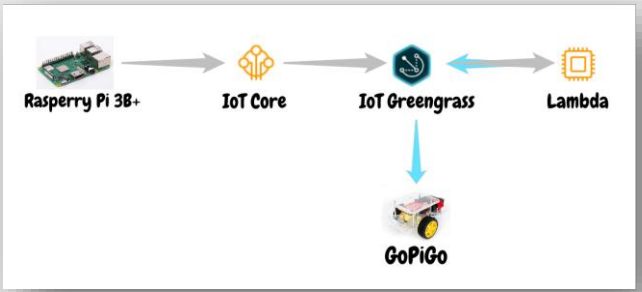
- Amazon Web Services Cloud
- AWS IoT Core, a service that allows devices to easily connect to the Cloud or to other devices
- AWS IoT Greengrass, a service that seamlessly extends other services to edge devices so they can act locally on the data they generate , while still using the cloud for management, analytics, and durable storage
- AWS Lambda, a service that lets run code in Cloud or in other devices when working with AWS IoT Greengrass

Blockchain Pathway

- Mobile devices and Raspberry connect to online Ethereum node through Infura
- Smart Contract is loaded in the network
- Devices Interact with the Blockchain through the Smart Contract
- Raspberry Pi detects new actions through events sent by the Smart Contract

Cloud Pathway

- Raspberry Pi sends a message to AWS Cloud IoT Core
- IoT Greengrass reads the message from IoT Core
- IoT Greengrass triggers Lambda function
- Lambda function runs on every device connected to the Cloud through IoT Greengrass



So where can I use this architecture?

On any system that needs to have a secure part and an IoT part. An objective example of this would be an agribusiness management service, where multiple managers around the world, through one application, could manage various tractors, represented in this project as the GoPiGo. Thus, if there was mismanagement by any member, this would be noted "forever" on the blockchain, and the other managers could act accordingly.