



Regina Analytics

Regina Analytics, Pty Ltd.

**Smart Farming**

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IoT-based smart farming



## Smart farming

In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere.



## About Us

We are a professional services firm delivering AI-powered software and technical solutions to companies who want to leverage data and machine learning algorithms for business value.



## How it works

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We insert sensors all over the farm for data collection and reporting

## Process

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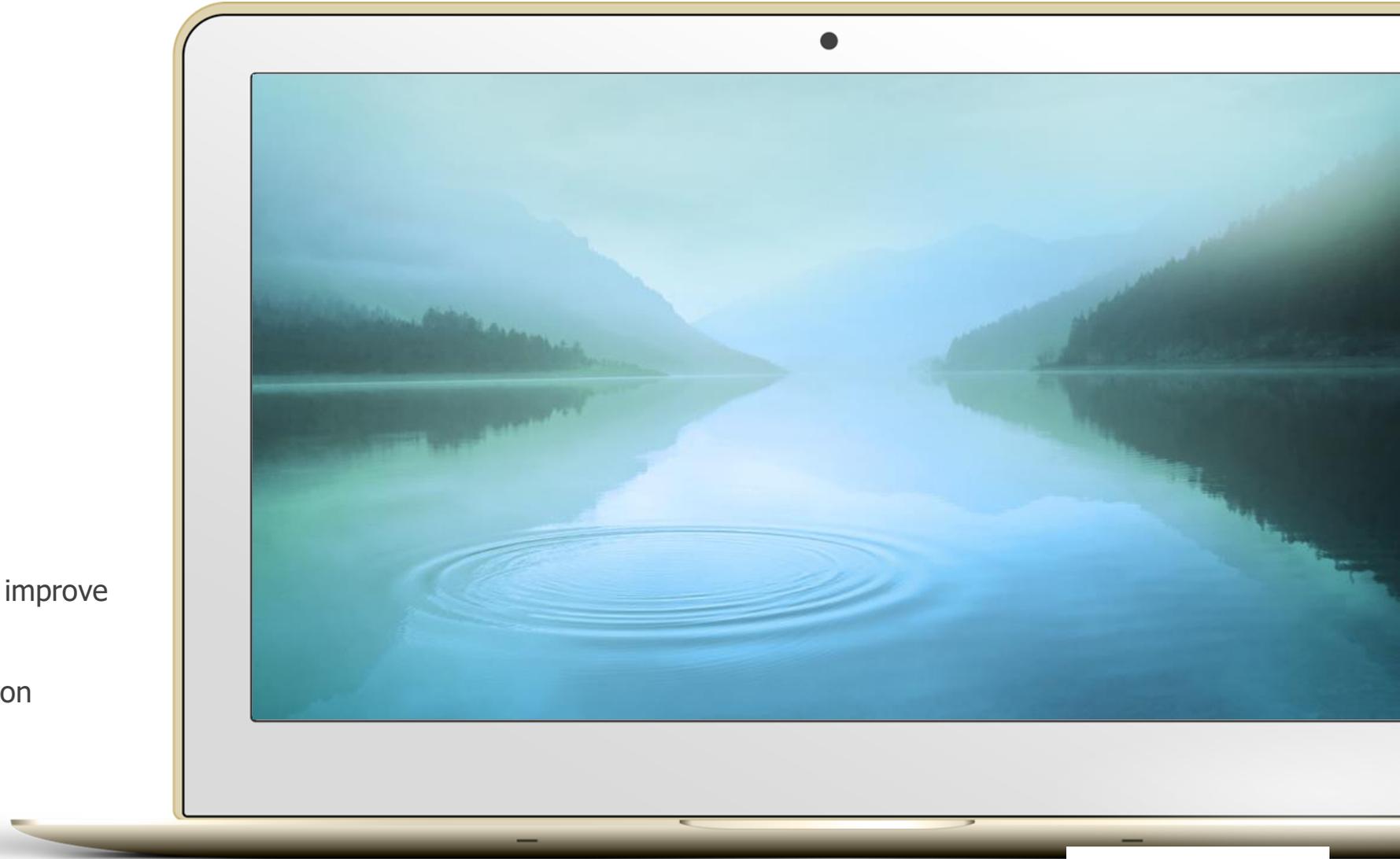
We use IoT device boards, whereby the board provides atmospheric data such as light level, barometric pressure, temperature, and humidity. Additional sensors are attached with the grove connectors. The board also includes a secure crypto processor with Google keys to enable connectivity with Google Cloud IoT Core services, allowing to securely connect to the device and then collect, process, and analyze the sensor data.

# Cloud based Solutions

Can be accessed  
anywhere

Other benefits include:

- Versions management (models)
- Updates are frequently to protect and improve the interface
- Easy backup systems for data protection





## Reporting

Dashboards are a type of graphical user interface which often provides at-a-glance views of key performance indicators relevant to a particular objective or farming process. Real time reports are provided to the farmers on the information they require for the day to day running for the farm.

# Dash boards

Customized data visualization system



# Machine Learning

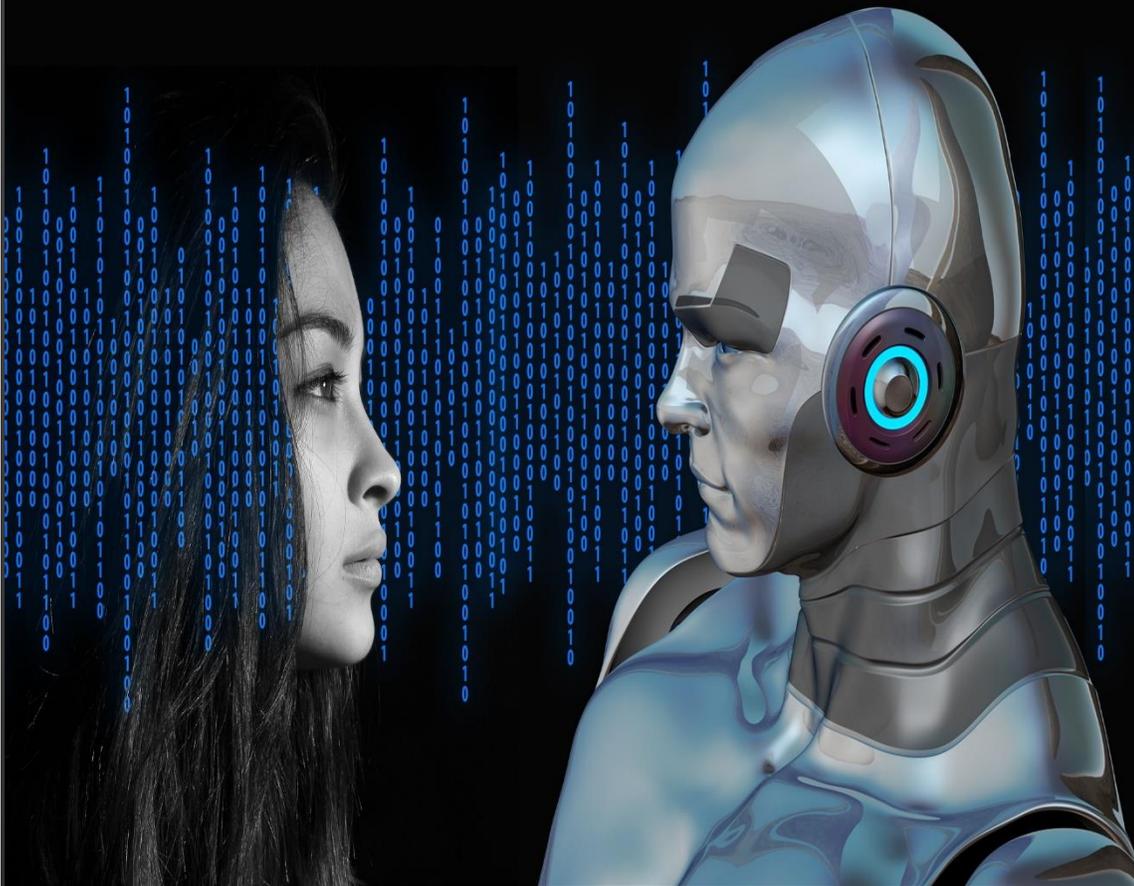
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Overtime in data collection, patterns are identified to develop algorithms

## Machine learning Algorithms

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Machine learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.



# Artificial Intelligence

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Deployment of models into devices or machinery

## Robotics

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After the computer has learned and identifies patterns. We develop algorithms whereby you train and test the model, using methods like deep learning system. Deep learning is where artificial neural networks, algorithms inspired by the human brain, learn from large amounts of data. Similarly to how we learn from experience, the deep learning algorithm would perform a task repeatedly, each time tweaking it a little to improve the outcome. This intern will be incorporated into engineering and electronics to develop arms and other robotic structures to better the processes available.

# Smart farming in depth

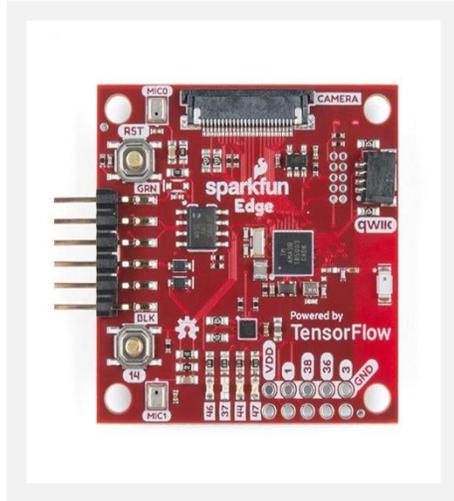
Specifications of our operations

# Tensorflow lite Device-Based Models.



Coral Dev Board  
(Mendel OS, Edge  
TPU Models )

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Micro-Controllers  
(SparkFun Edge)

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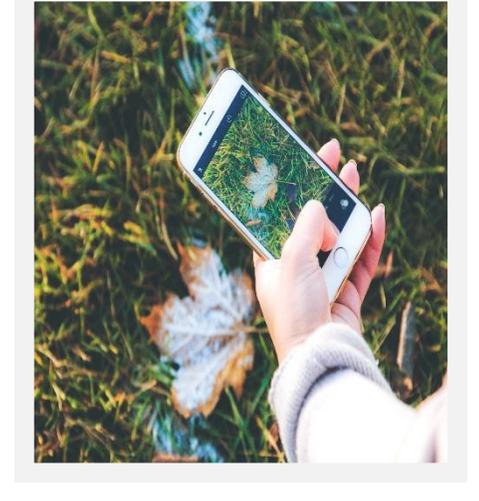
Raspberry Pi  
(Raspbian (OS))

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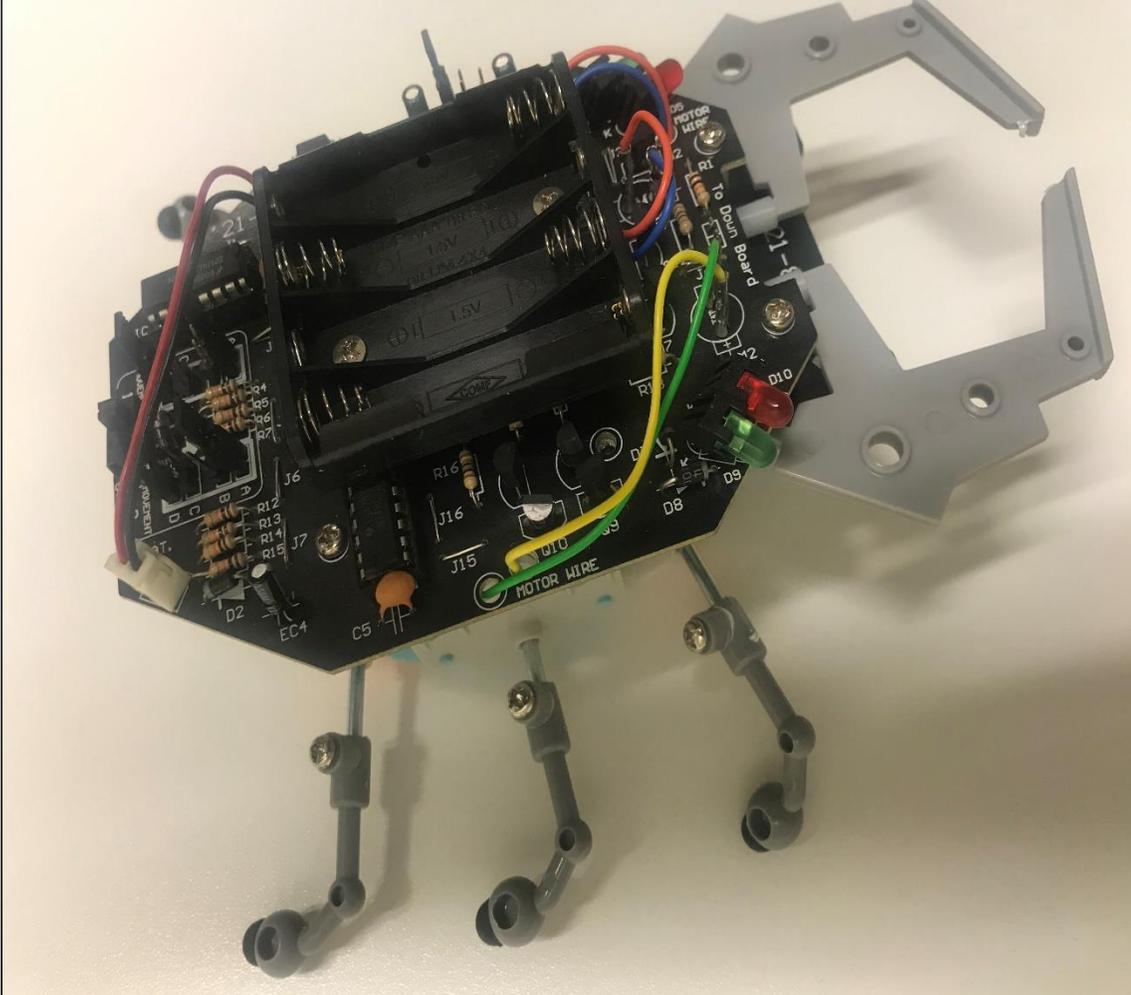
Environmental  
Sensor Board

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Mobile devices

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## Coral Dev Board (Mendel OS, Edge TPU Models )

A development board to quickly prototype on-device ML products. Scale from prototype to production with a removable system-on-module (SoM).

## Raspberry Pi (Raspbian (OS))

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote teaching of basic computer science in schools and in developing countries.

## Micro-Controllers (SparkFun Edge)

A self-contained system with a processor, memory and peripherals and can be used as an embedded system.

## Android(Google) & Xcode(Apple iOS)

Models to be used on an Android devices or Xcode (iOs Apple) devices like image classification, voice recognition or object detection.

# TensorFlow lite

TensorFlow Lite is an open source deep learning framework for on-device inference.



# Environmental Sensor Board

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We insert sensors in all vital parts of the farm to obtain information to be used in developing smart devices

## Sensory board

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The Environmental Sensor Board is an add-on board (also known as a pHAT or bonnet) that adds sensing capabilities to your Coral Dev Board or Raspberry Pi projects. (It includes an EEPROM for compatibility with Raspberry Pi boards.)



# Drones

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An unmanned aerial vehicle, which is an aircraft without a human pilot on board and it uses a ground-based controller to fly it.

## What they do

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An agricultural **drone** is an unmanned aerial vehicle used to help optimize **agriculture** operations, increase crop production, and monitor crop growth. Sensors and digital imaging capabilities can give **farmers** a richer picture of their fields.



# TensorFlow.Javascript

Develop ML models in JavaScript, and use ML directly in the browser or in Node.js.

## Browser base model

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**Java Script**, an open-source library you can use to define, train, and run machine learning models entirely in the browser, using **JavaScript** and a high-level layers API

# TensorFlow Models



  
Regina Analytics

## TensorFlow Models

TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML powered applications.

## Tensorflow Serving Models

TensorFlow Serving is a flexible, high-performance serving system for machine learning models, designed for production environments. TensorFlow Serving makes it easy to deploy new algorithms and experiments, while keeping the same server architecture and APIs. TensorFlow Serving provides out-of-the-box integration with TensorFlow models, but can be easily extended to serve other types of models and data.

## Enterprise models

Developing models to suit client needs that could be deployed in production. The models are not only limited to TensorFlow. The models could be in Amazon(Sage), Facebook(PyTorch) etc.



# Smart farming improves yields

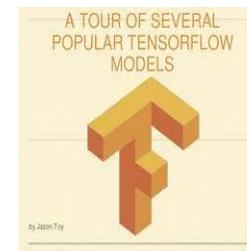
Continuous improvement of farming through R & D





# Solutions

We model data, to give intelligence solution for agriculture problems in creating efficiency and effectiveness



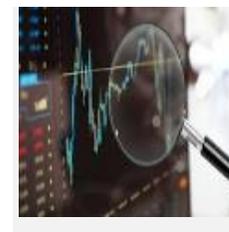
## Tensorflow models

Solving problems using Tensorflow



## Training & Events

Artificial Intelligence is a new subject which needs training



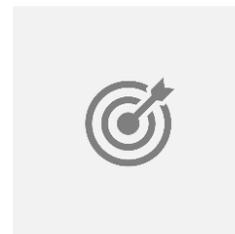
## Data Analysis

Database manipulation to develop sensible Business Intelligence systems



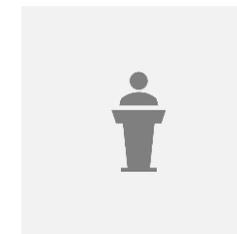
# Products

We develop customized models to solve our client problems and deploy them in production



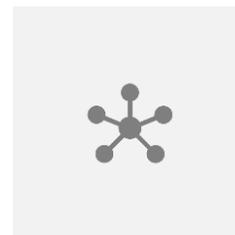
Unique

Customized to suite each customer



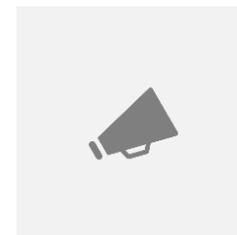
First to Market

We develop solutions that gives competitive edge



Tested

All our systems go under a process of clarification before deployment



Authentic

Developed through R&D for each specific customer

We focusing on predictive analytics, natural language processing, and computer vision, we help businesses innovate with AI, enrich customer insights, automate processes & be more cost-efficient. This is ensured by our proprietary technologies, exceptional customer care, constant investment into talent development and R&D.



## Summary

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Nothing is Impossible



Regina Analytics Pty Ltd.

# Thank You

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