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Development, prototyping and manufacturing of well-tailored and cost-effective future-proof hardware products and IoT systems

# We are IRNAS

We specialize in **rapid development** of **well-tailored cost-effective future-proof hardware products and IoT systems.**
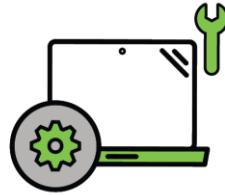
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Fields of Expertise

- IoT devices & sensors

- Wireless networking

- Conservation technology systems

- 3D bioprinting development

- CNC scientific instruments

- Medical devices

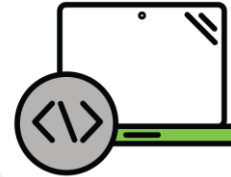- Mathematical analysis and modelling

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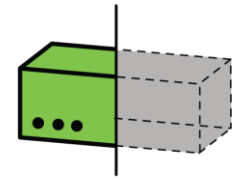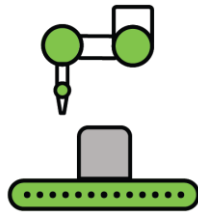# A complete hardware product development service:
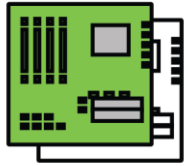
Electronics engineering

Software development

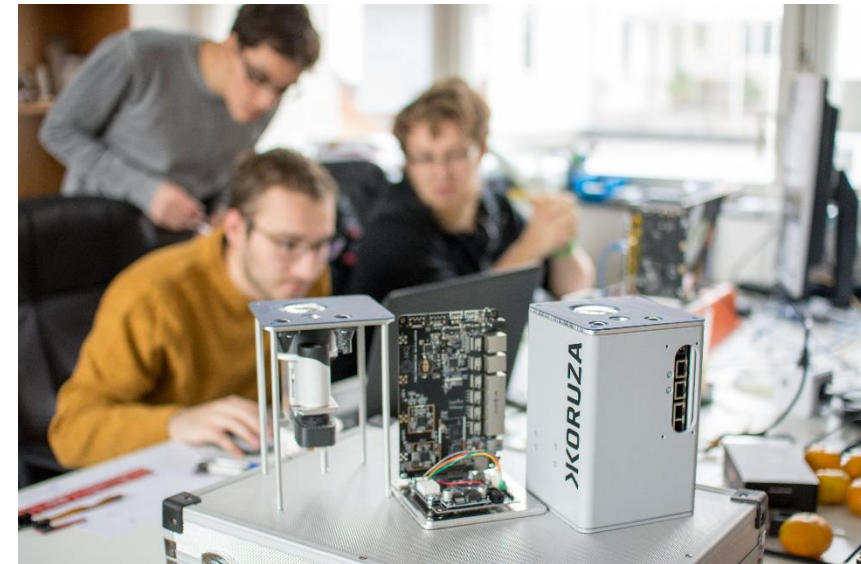Mechanical engineering

Rapid prototyping

Manufacturing

Deployment procedure preparation and Field testing

On-site support

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Cross-disciplinary team

✓ Mechanical engineering

✓ Electrical engineering

✓ Software engineering

✓ Data analysis and numerical control

✓ Acoustical engineering

✓ Medical and bio-engineering

✓ Marketing and business

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Cross-disciplinary team

Luka Mustafa
CEO and Founder of
IRNAS and Fabrikor

Eva Černčič
Programmer and
analyst

Vojislav Milivojević
Electronics Engineer

Mihael Miško
Production manager,
Mechanical Engineer

Jernej Kos
Software developer

Blaž Bratuš
Mechanical Engineer

Boštjan Vihar
Biologist

Luka Banović
Biomedical and
Acustical engineer

Anja Lazar
Marketing and
Impact

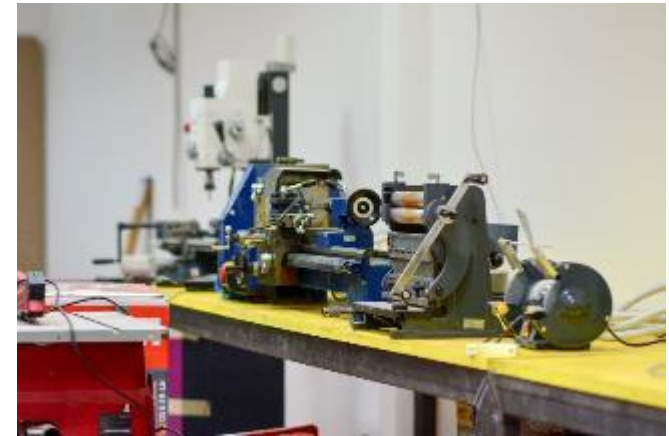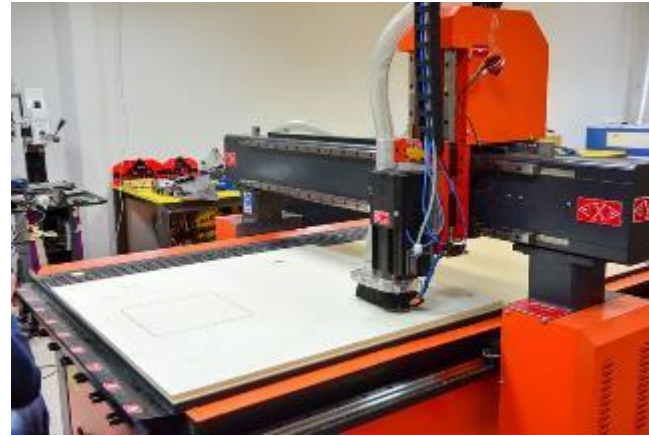**Barbara Razdevšek**
Sales Manager

Goran Kecman
Embedded software
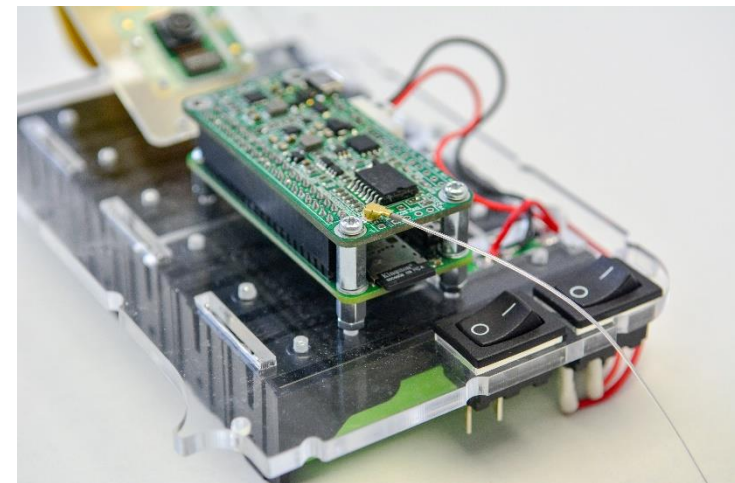engineer

Jure Zagoranski
Projects support

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In-house Prototyping & Manufacturing

Projects

KORUZA

Wireless optical communication system enabling building-to-building connectivity with an eye-safe highly collimated infra-red light beam at a capacity of 1 Gbps or 10 Gbps, at distances up to 150 meters.

Services:

✓ Electronics engineering

✓ Software engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Medium size series manufacturing

✓ Experimental testing for scientific applications

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Optical beam analysis

Detailed analysis of an optical beam in free-space is key to understanding and designing an optimal long-distance communication setup. Beam scanner has been developed to: enable analysing an optical beam in 3D, enable evaluation of beam divergence, profile the power distribution and automatically optimize the placement of optical receivers and transmitters behind the lens or other optical elements.

Services:

- ✓ Electronics engineering
- ✓ Software engineering
- ✓ Mechanical engineering
- ✓ Experimental testing for scientific applications
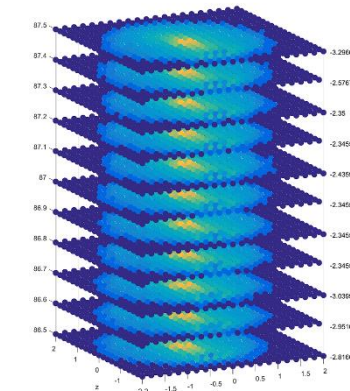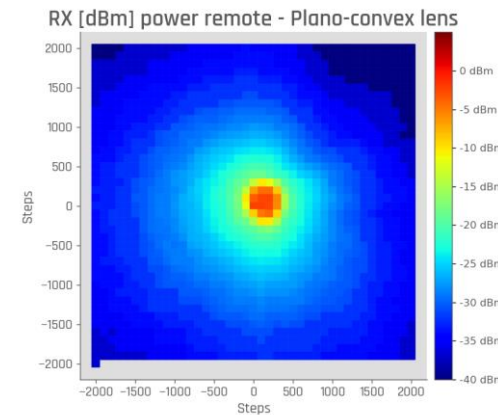
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Vitaprint 3D Bioprinting

A full package of open 3D bioprinting including open, fully customizable, modular, easy to modify and cost effective hardware design, open methods (protocols of material preparation, parameter calibration and testing procedures) and open demo files.

Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Experimental testing for scientific applications

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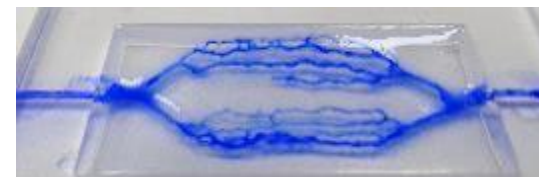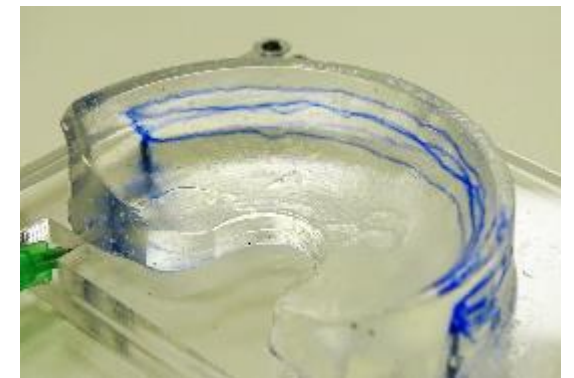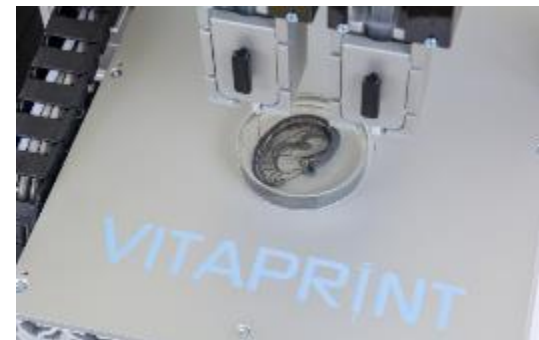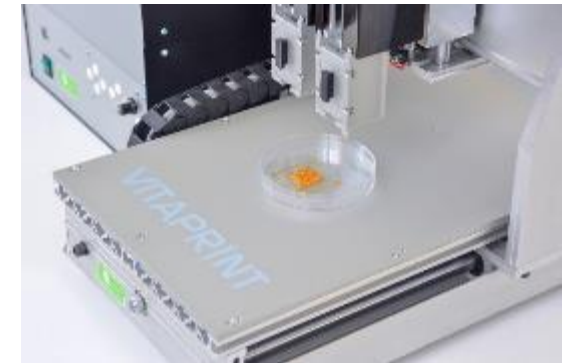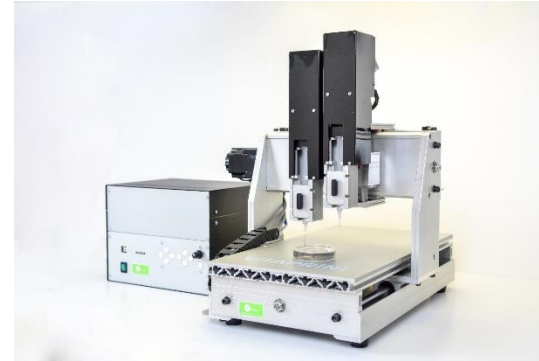
PiRA IoT Battery Pack

A universal solution for solar powered IoT devices, implementing all commonly required features - charging, battery monitoring, voltage regulation, power scheduling, battery protection, standard LiPo cell usage, and optional on board processor – that can be easily and rapidly integrated into target applications.

Services:

✓ Electronics engineering

✓ Software engineering

✓ Rapid prototyping

✓ Medium size series manufacturing

Timer Mode Select
Charge enable (R24)
RPI Expansion Header
uFL Lora Antena
RTC backup
I2C Display Header
RTC power select
Communication Header
FET Voltage Select
Battery Connector
Solar Panel Connector
Battery Thermistor Connector
Enable Header
Charge LED Indicator
Micro USB Charger Connector
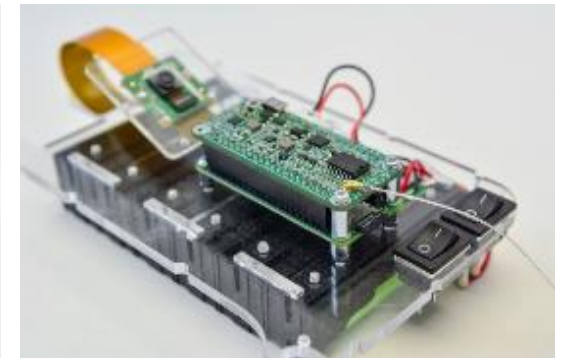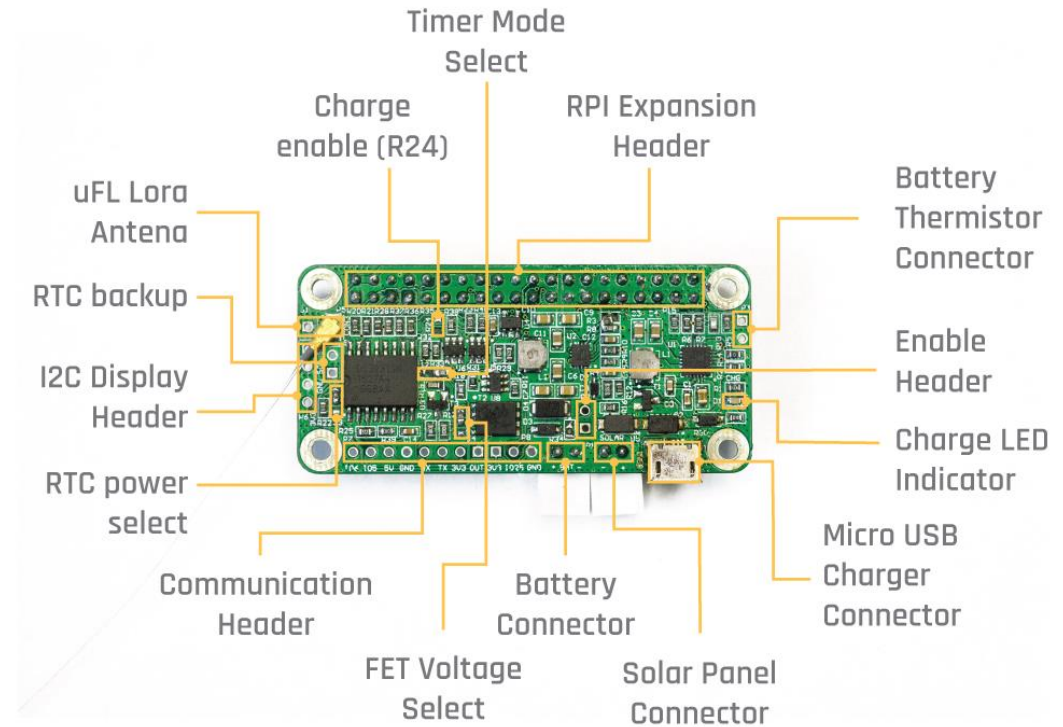
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PiRA Zero

Arribada FMP

Arribada AMP

Arribada PMP

Solarcast

Arribada PitStop tag

Safecast Solarcast

Air quality sensor device, designed to operate off-grid and sense environmental parameters. With five key modules designed for maximal reuse: air sensor module, Geiger sensor module, battery power module, communications module, gateway module.

Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Small size series manufacturing

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LoraWAN Drone Coverage Mapping

Automated drone-assisted network coverage mapping enables rapid roll-out of sensor networks in remote environments.

Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Technical supervision of eexperimental deployment
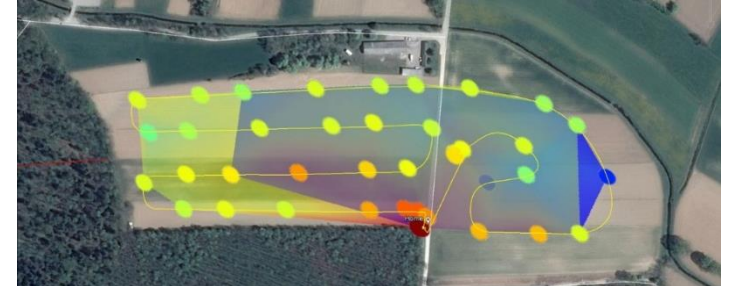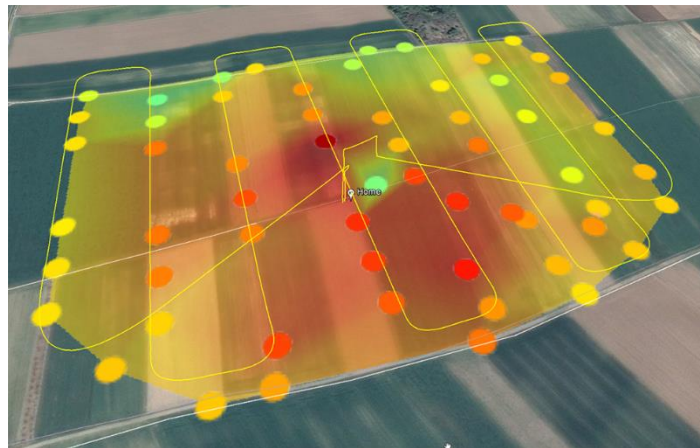
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Antenna radiation pattern
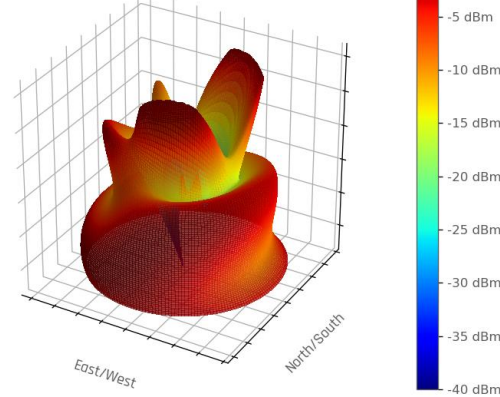
Drone measured antenna radiation
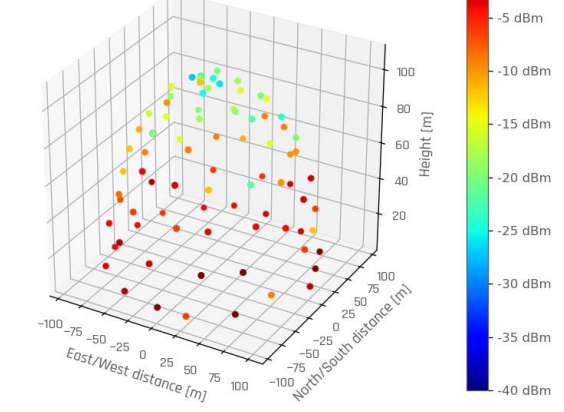
Antenna radiation XY plane
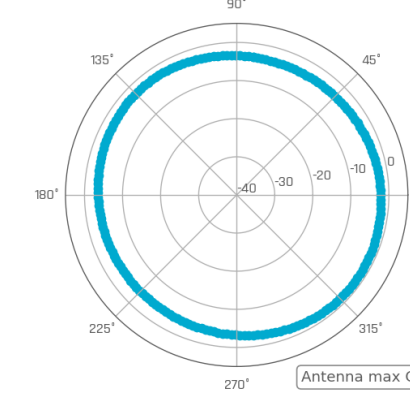
Antenna radiation XZ plane
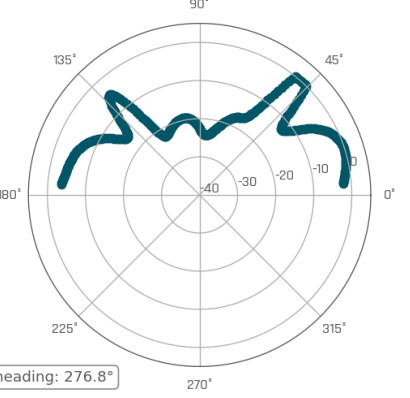
Antenna max GEO heading: 276.8°

Antenna radiation pattern
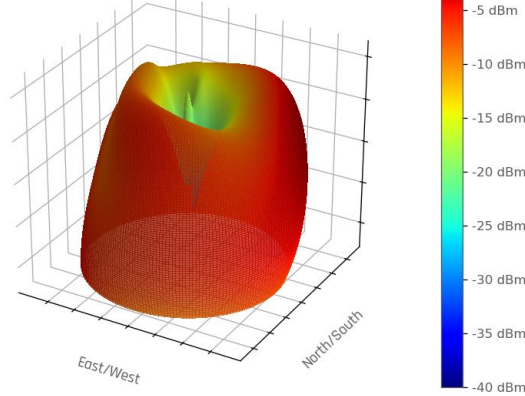
Drone measured antenna radiation
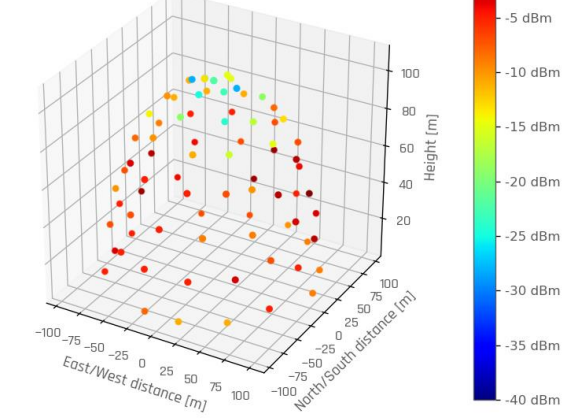
Antenna radiation XY plane
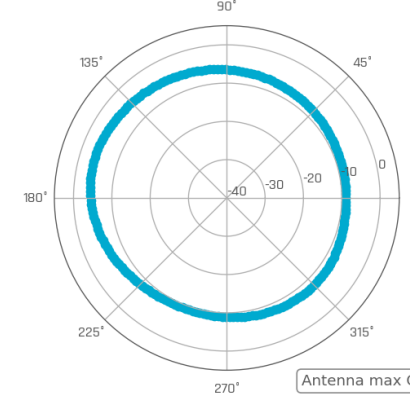
Antenna radiation XZ plane
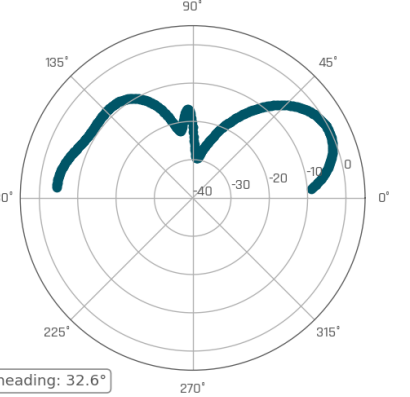
Antenna max GEO heading: 32.6°

Glia Pulse Oximeter

Cost-effective medical pulse oximeter, designed for production in import-limited environments. Solution is optimized for 3D printing production enabling maximal servicability over long use-cycles.

Services:

✓ Electronics engineering

✓ Software engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Small size series manufacturing

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Conservation Tech

AAMP - Arribada Arboreal Monitoring Platform

Camera based AAMP with WiFi connectivity and solar power for remote area deployment, linking individual locations together using line-of-sight radio hubs. Each hub stores and forwards data received from the camera to a central location.

Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Small size series manufacturing

✓ Technical supervision of experimental deployment
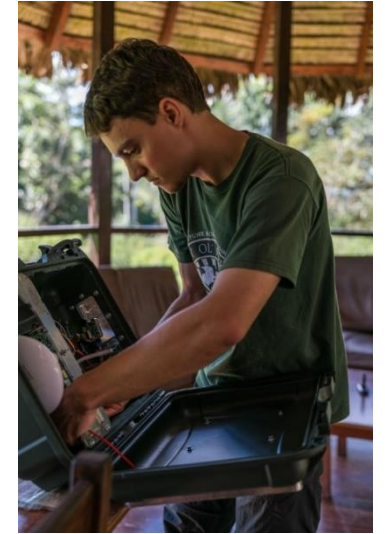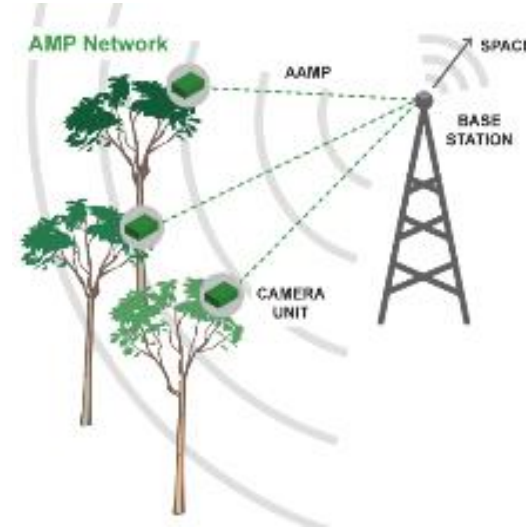
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AFMP - Arribada Freshwater Monitoring Platform

Solar-powered standalone water level monitoring and camera device for remote areas with satellite and LoraWAN connectivity for instant deployment anywhere in the world.

Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Small size series manufacturing

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AFMP disassembly

waterproof case - weather resistent, rugged and simple to use

Irridium satellite modem for global reporting

control switches

camera - capturing Full-HD video and snapshots

Raspberry Pi Zero W - main processor with WiFi interface

PiRa zero - advanced power scheduling IoT circuit with LoraWAN

solar panel connector for connecting external cells

attachment points - for suspending across the river

ultrasonic distance sensor for measuring water level

LoRa omni antenna for low-power long range communication

battery pack - 4x 18650 LiPo cell

solar panels 2x 6W for off-grid operation

Developed by **irnas** for **ARRIBADA** *initiative* using cutting edge technologies by 🍓 THE THINGS NETWORK | resin.io | OCO Voltaic

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APMP - Arribada Penguin Monitoring Platform

Rugged solar-powered camera unit for deployment on Antarctica, providing year-round periodic snapshots of the surrounding area with edge-processing capabilities.
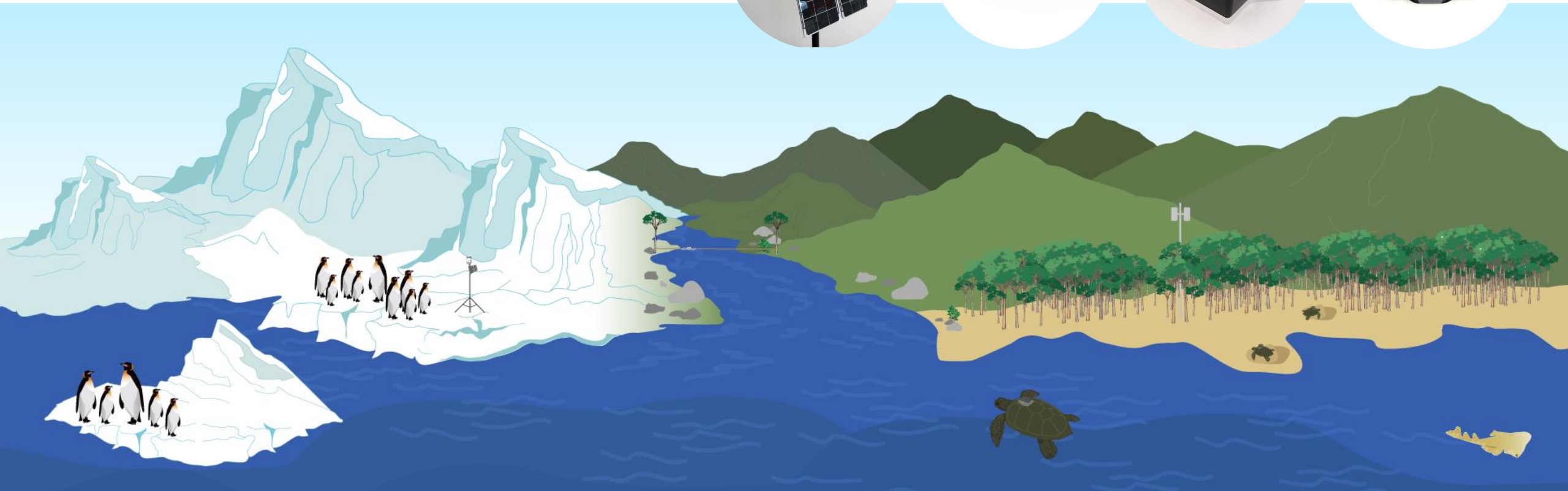
Services:

- ✓ Electronics engineering
- ✓ Mechanical engineering
- ✓ Rapid prototyping
- ✓ Small size series manufacturing

FIND OUT MORE

APMP disassembly

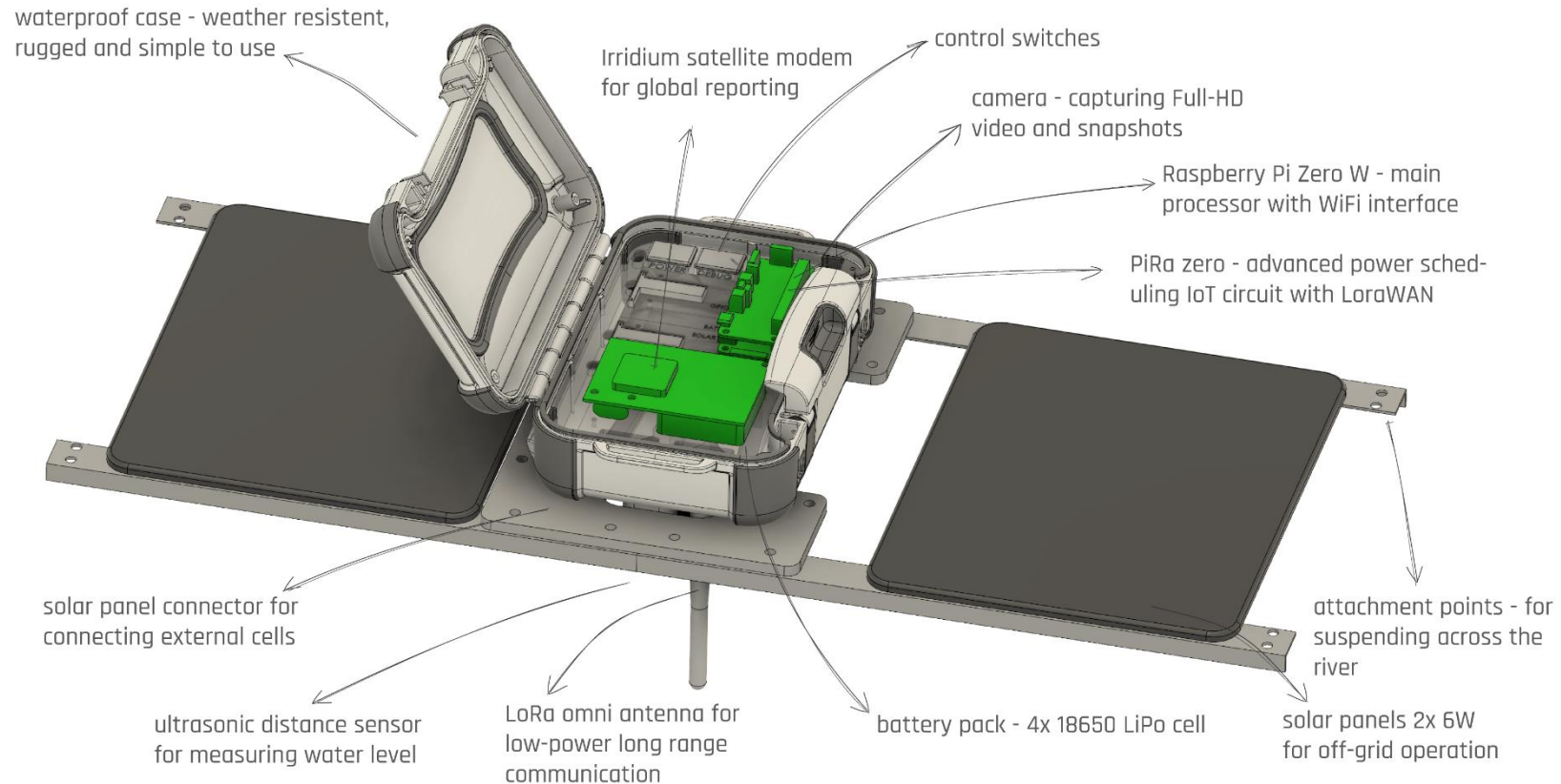control switches

Raspberry Pi Zero W - main processor for video recording

PiRa zero - advanced power scheduling IoT circuit with LoraWAN

universal mount with angle adjustment

camera - capturing Full-HD video and snapshots

solar panel connector for connecting external cells

battery pack - 6x 18650 LiPo cell

camera window

waterproof case - weather resistent, rugged and simple to use

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Arribada Pitstop Turtle Tag

Durable and water-proof turtle cameras and tags, used to track the movement of sea turtles and collect the information necessary to design better strategies for their conservation.
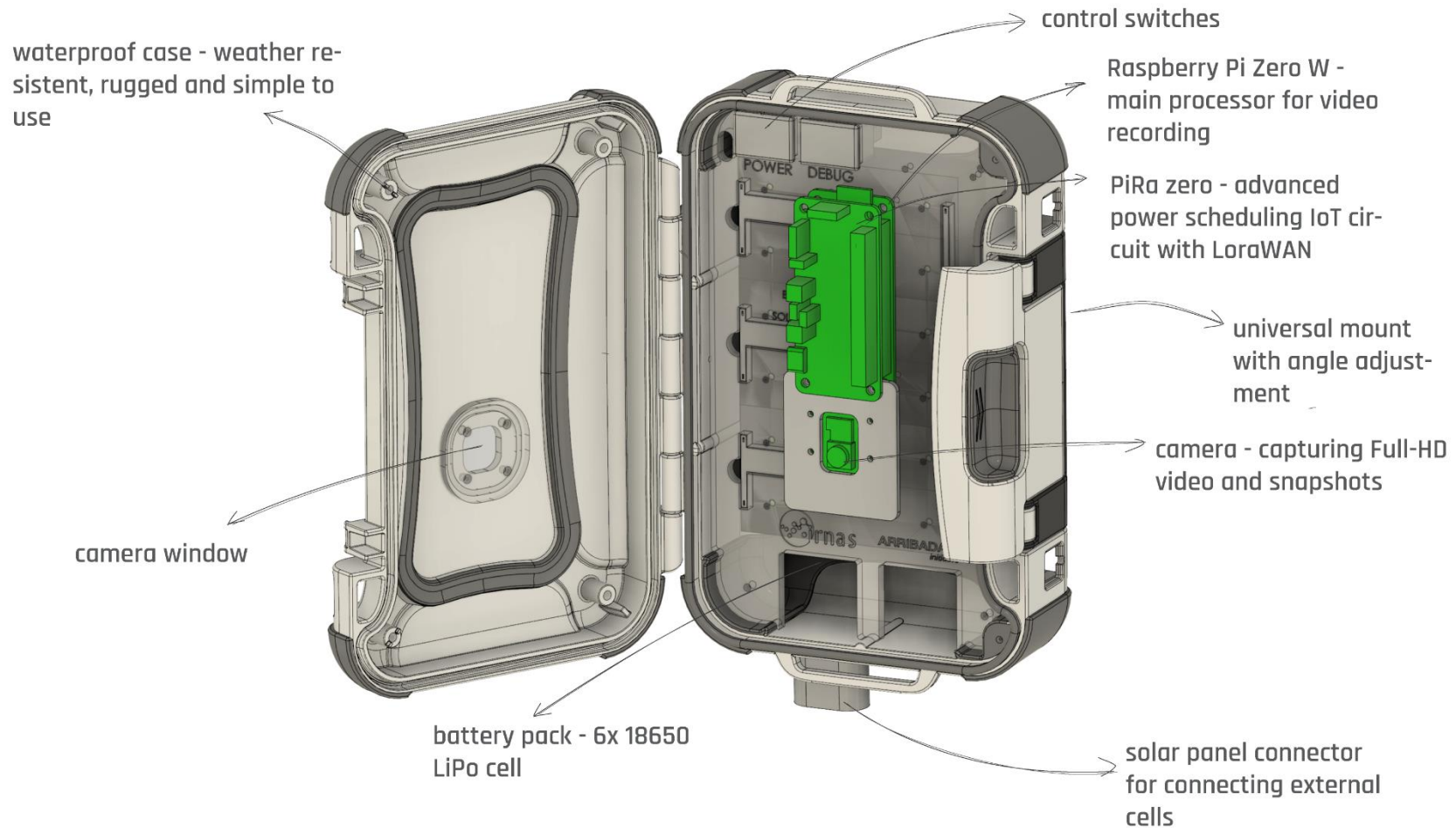
Services:

✓ Electronics engineering

✓ Mechanical engineering

✓ Rapid prototyping

✓ Small size series manufacturing
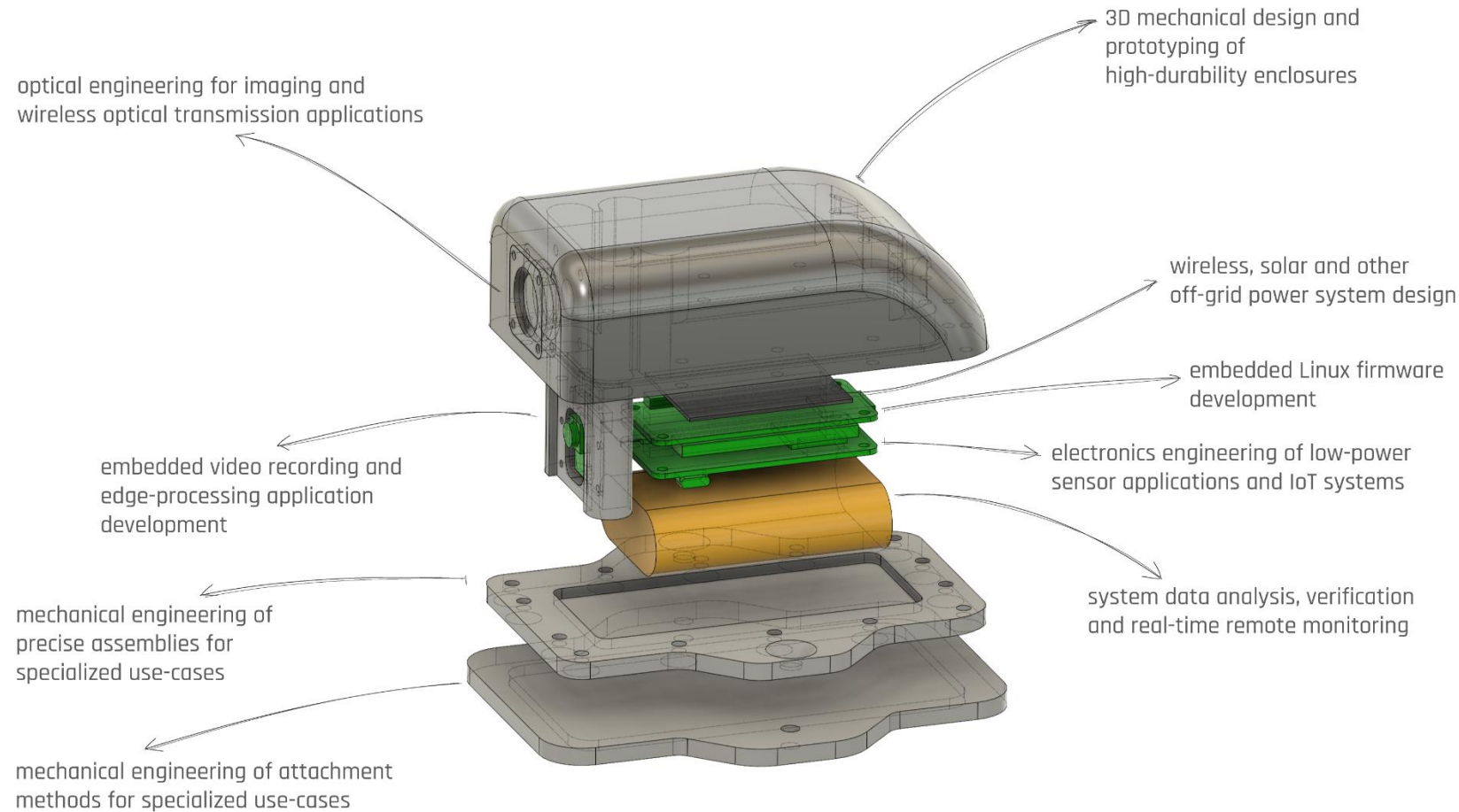
✓ Technical supervision of experimental deployment

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VIDEOS FROM TURTLE CAMERAS

Pitstop Turtle Tag Development Workflow

3D mechanical design and prototyping of high-durability enclosures

optical engineering for imaging and wireless optical transmission applications

wireless, solar and other off-grid power system design

embedded Linux firmware development

embedded video recording and edge-processing application development

electronics engineering of low-power sensor applications and IoT systems

mechanical engineering of precise assemblies for specialized use-cases

system data analysis, verification and real-time remote monitoring

mechanical engineering of attachment methods for specialized use-cases

Thank you!

Connect

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info@irnas.eu