



2024



**PETROBRAS**



NOKIA

## MINI CV: Miguel Ignacio Serrano



Over 10 years of commitment to helping humanity with robotic solutions.

We create inspection and maintenance solutions applied to the mining, energy and O&G industries, looking for reduce risk to human life in dangerous tasks.

CEO and founder of INSTOR since 2008 to the present.

Master's degree from UFRGS focus on control and automation of hydraulic systems.

More than 10 years of experience, coordinating innovative and disruptive projects in the robotic field.

Over 9 patent applications and 2 already granted.

Graduated from UNAM in Argentina in Electronic Engineering

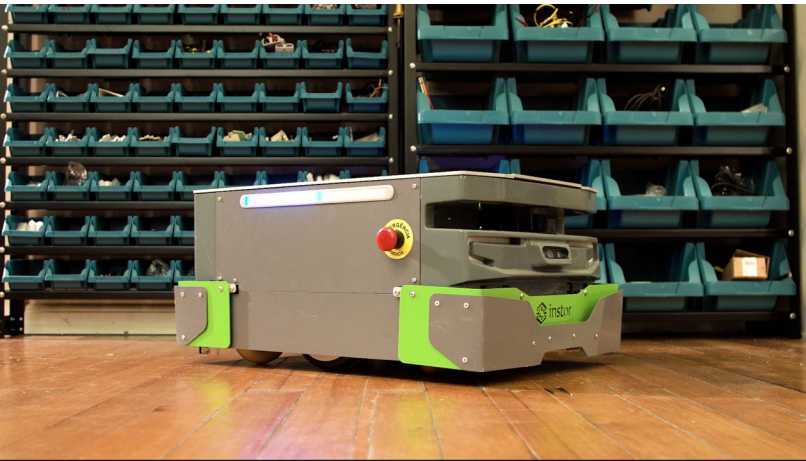
Electromechanical Technician from EPET 15 in Argentina.

**E - MAIL:** miguel@instor.com.br





# Robots to help Humankind!





A large offshore oil rig, the Petrobras S1, is the central focus of the image. It is a complex structure of steel, pipes, and platforms, painted in yellow and grey. The rig is situated in the middle of a blue sea under a clear blue sky. Two smaller support vessels are visible near the rig. The text 'PETROBRAS S1' is visible on a yellow platform. A white banner with black text is overlaid on the right side of the image.

# Robotic inspection for hazardous areas Information in real time



# Faraway places

High Travel time and costs





# Faraway places

High Travel time and costs





# Hazardous areas

Risky operations



# Hazardous areas

Risky operations





## First AMERICAN ATEX Autonomous Robot

**Segurança**



OCP0160



**INMETRO**

**CPEX 22.0983X**



Instor - Projetos e Robótica LTDA

Modelo: Tupã Ex

Nº de série: 001

Marcação: Ex db ib pxb | IIB T3 Gb

**Power by Cyxense® Commander**



# Ex Autonomous Robots Worldwide

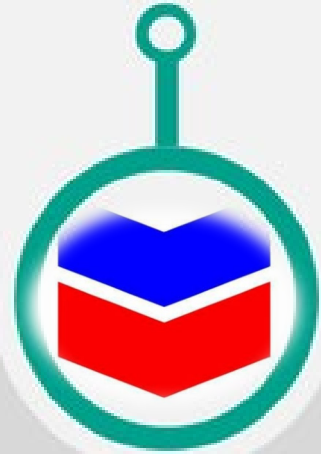
## Time Line



2014



2016



2019



2023



TAUROB



EX ROBOTICS







# TUPÃ - EX

First AMERICAN ATEX Autonomous Robot

## Characteristics

## AI



6hs



40°



## Sensors



CO - H2S - LEL






# Robot Commander

Robot Commander x +

← → ↻ Not secure | 192.168.111.4:5000

Robot Commander Tupa 

Marseille 16:06:15

### Status

- Robot status: ONLINE
- Emergency stop: OFF
- Battery: 25.9 V (66.4%)
- Localization status: GOOD

### Control

Navigation


Localization  Navigation

Tracks

Power ON  Emergency Stop




Lights

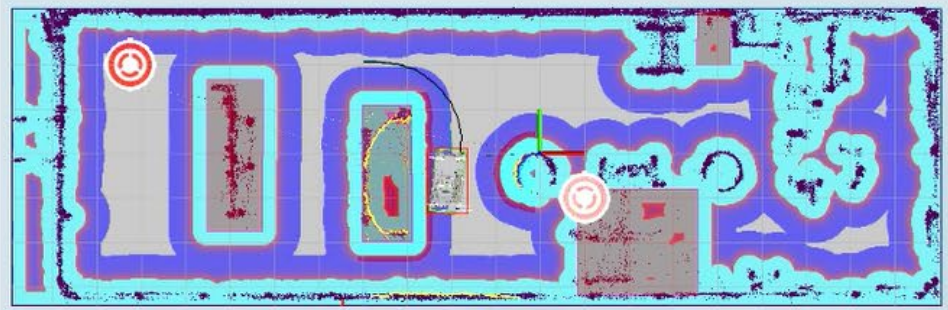
ON  OFF



### Map

platform\_poc


    Set initial pose  Set forbidden zone



### Cameras

Front camera  Rear camera  Inspection camera

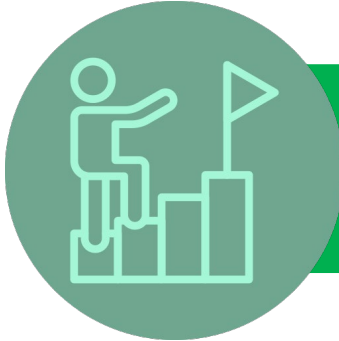
Thermal camera





# Robot Commander





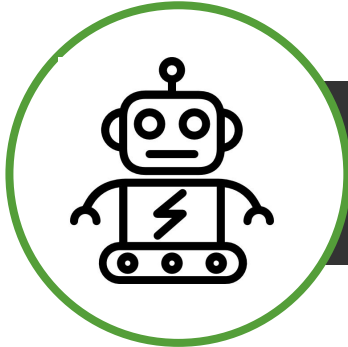
# CHALLENGES



Limited time



Limited Resources



New Concepts  
AMR are mobile machines

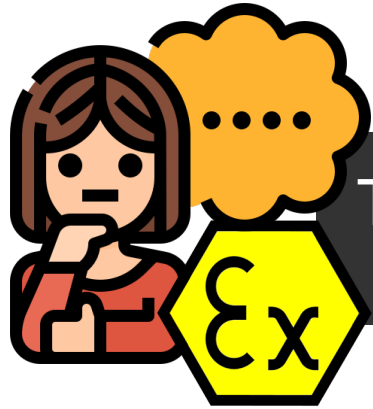


Few Laboratories in Brazil

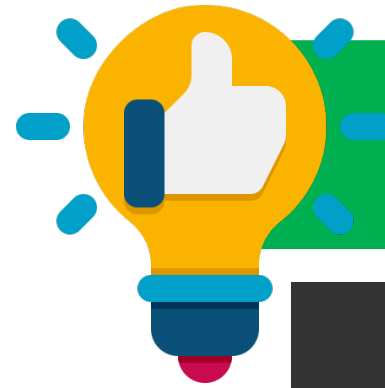


Limited Tests



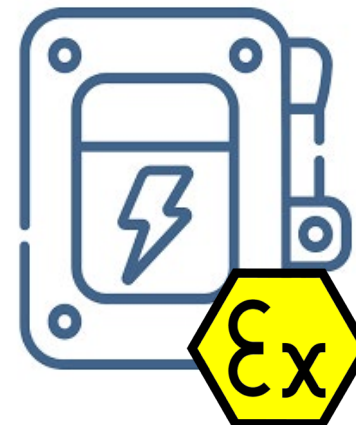
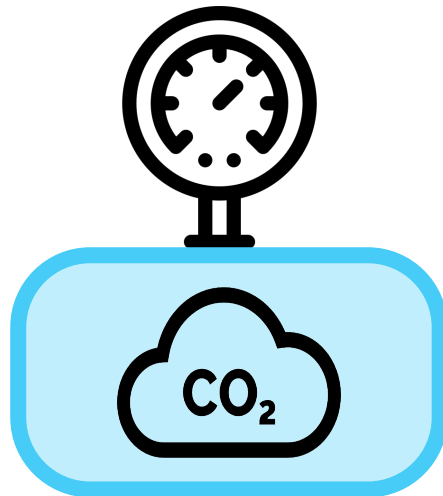


Thinking in the final solution since the beginning



**SOLUTION**

Combined Techniques





# TUPĂ - EX

Arm height: up to of 1.7m

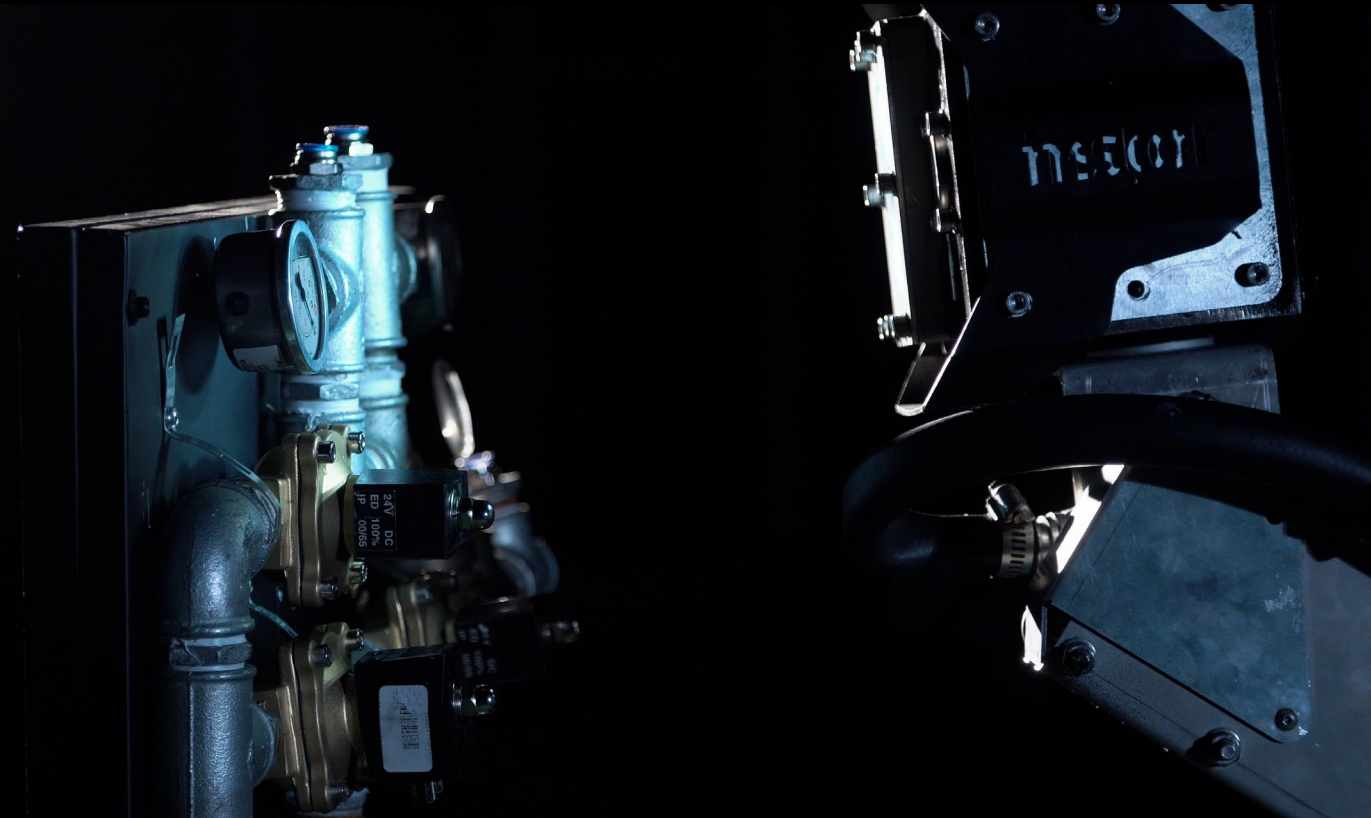


6,4 bar



## TUPĂ - EX

IA For gage reading





# TUPĂ - EX

4K Panorâmă Image

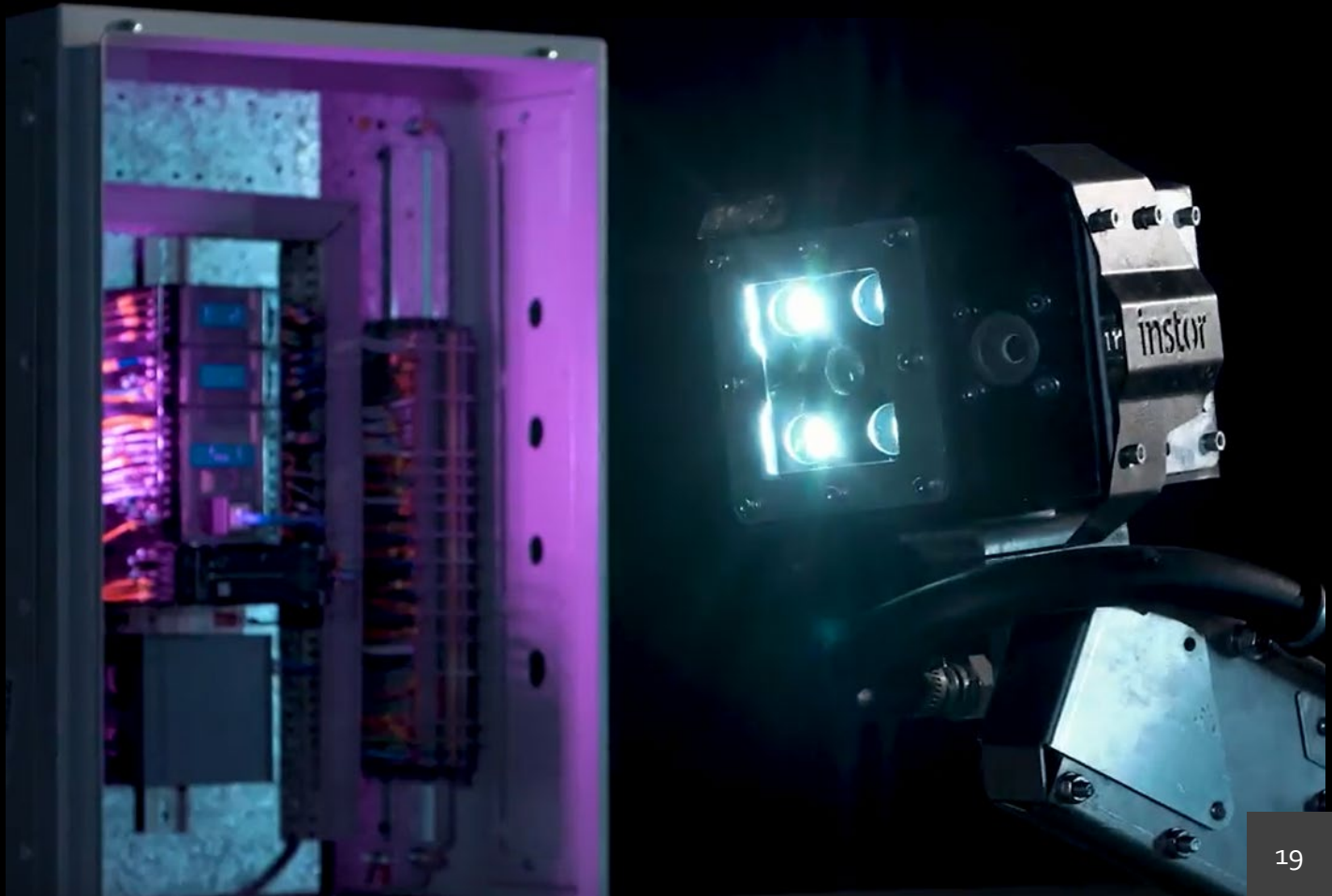
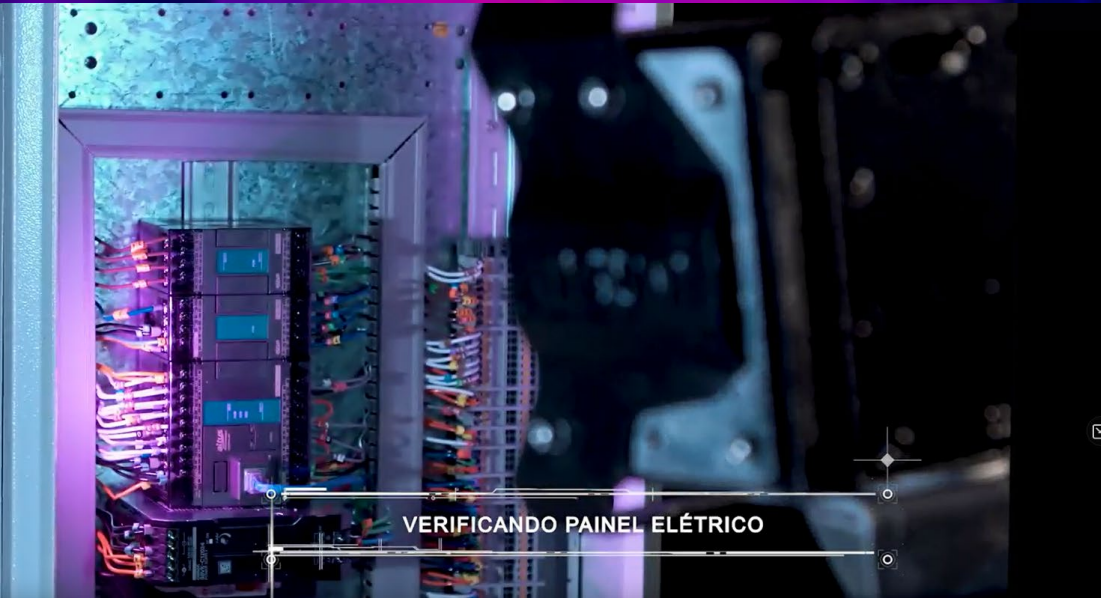






# TUPĂ - EX

Thermography

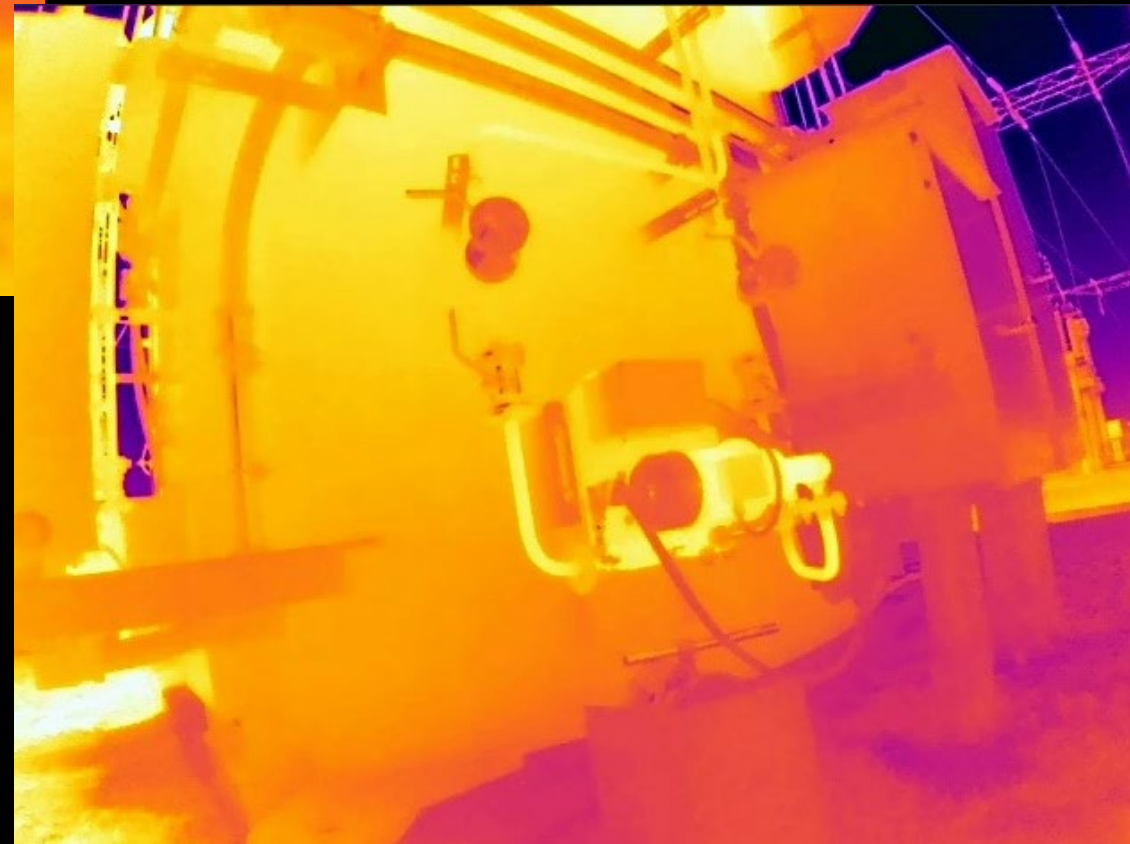




# TUPĂ - EX

Thermography

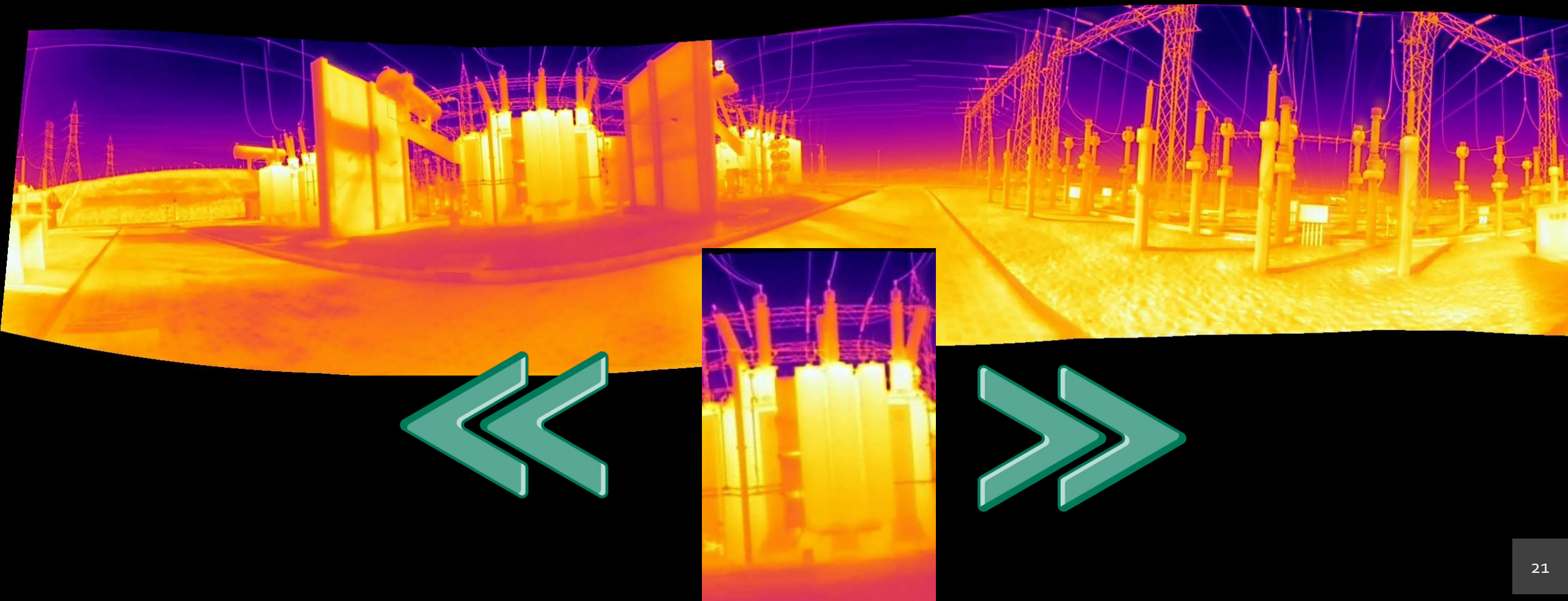
- ✓ Temperature measurement (close objects);
- ✓ Temperature comparison;
- ✓ History Record;
- ✓ Thermal image online.





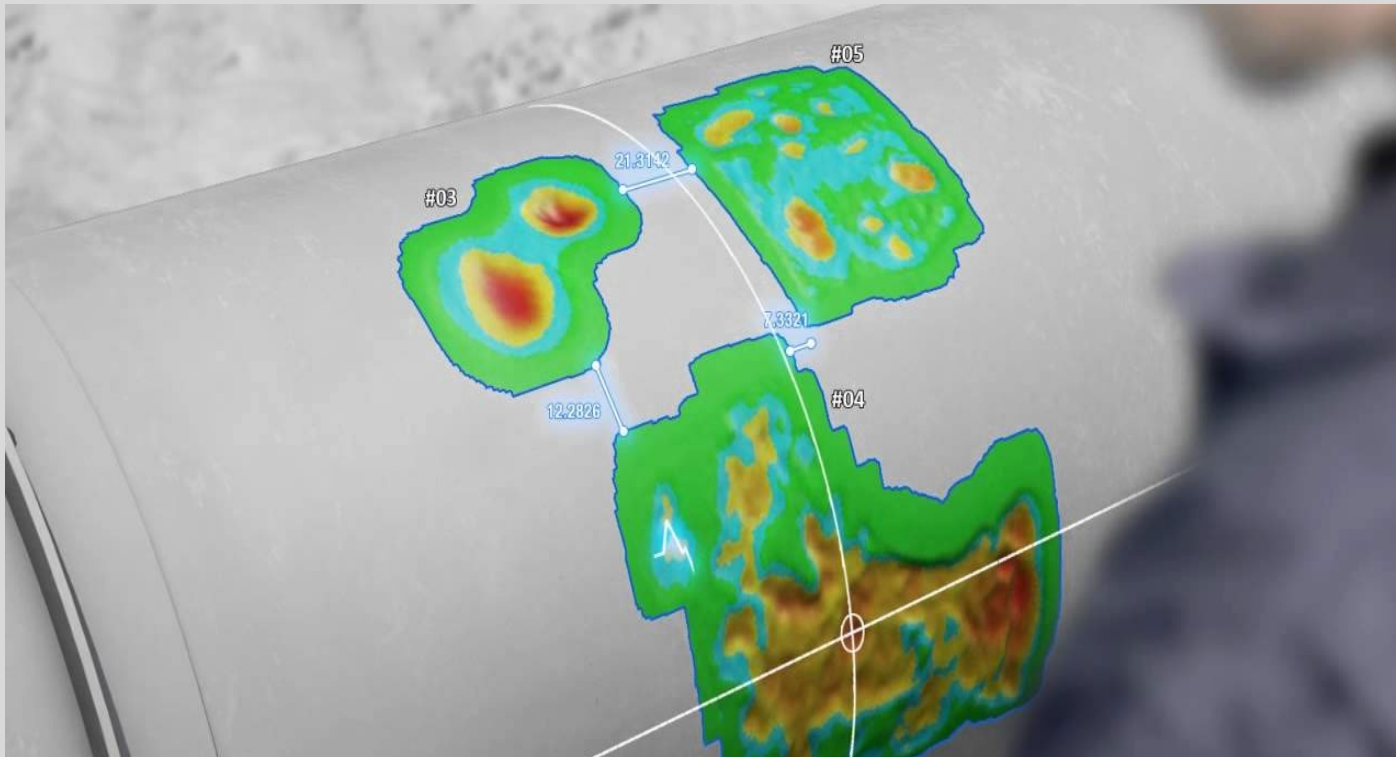
# TUPĂ - EX

Panorâmă Thermal Image



# TUPĂ - EX

## Corrosion mapping



- ✓ Real-time corrosion mapping;
- ✓ History record;
- ✓ Growth and location graph.



# TUPĂ - EX

3D Mapping

- ✓ 360 viewer image;
- ✓ 3D laser mapping;
- ✓ Digital Twin.



✓ Gas leak detection.



# TUPĂ - EX

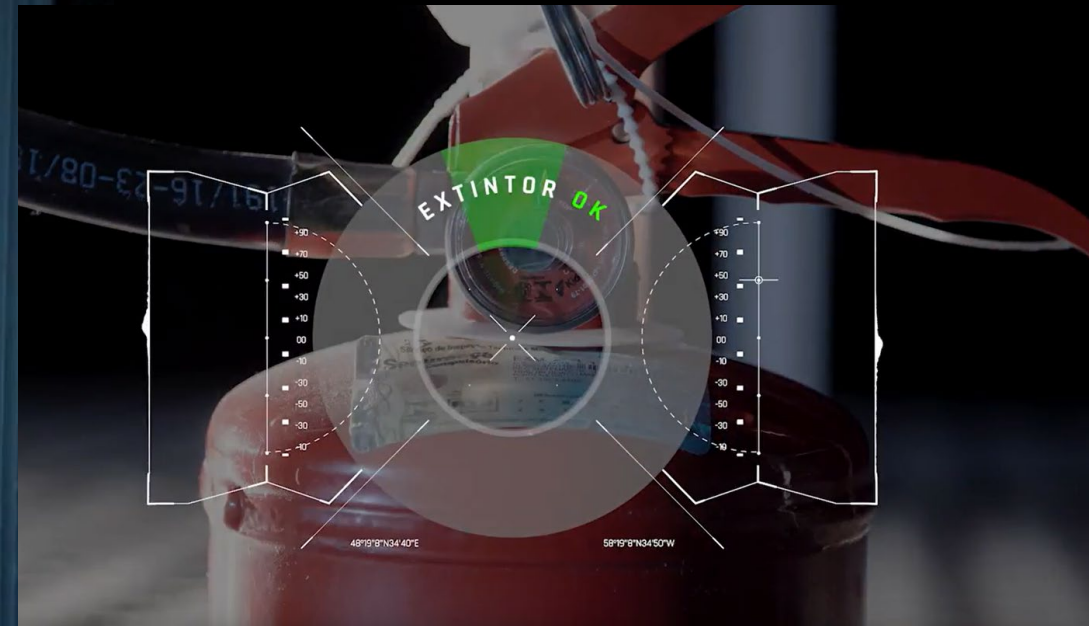
Ultrasonic Leak Imaging





# TUPÃ - EX

Fire extinguisher Checking



VERIFICAÇÃO DE EXTINTORES

# TUPĂ - EX

Gas detection

- ✓ Measurement of gas level;
- ✓ CO – H<sub>2</sub>S – LEL;
- ✓ Gas level mapping.



PRESENÇA DE GÁS DETECTADA





# TUPÃ - EX

Sound Analysis

- ✓ Ambient sound recording;
- ✓ Online audio;
- ✓ Sound history record;
- ✓ Sound level history by position.





# TUPĂ - EX

Connectivity





# TUPĂ - EX

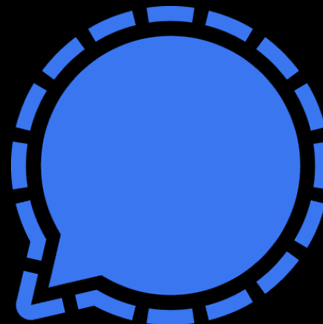
Get data using any app



Google Meet



zoom



# TUPÃ - EX

Wireless charging station

Recarga sem fio

Conexão wifi para descarga de dados



 instor

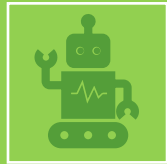


# Our Identity



## Mission

Reducing Risk Exposure of men by mobile robotics solutions.



## Vision

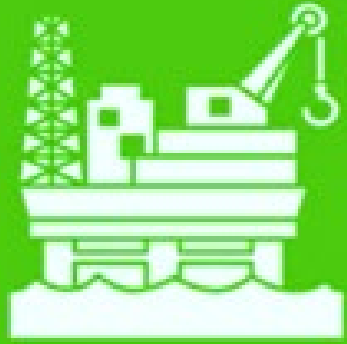
Become a reference in mobile robotics with high quality solutions.



## Values

Passion for our work;  
We are powered by challenges;  
We like to think outside the box.

# Business area



O&G



MINING



ENERGY



LOGISTIC



HEALTH





# Business model

- ✓ Robot as a service
- ✓ Sale/rental
- ✓ Data generation

# Main Customers



***PETROBRAS***



***TRANSPETRO***







Research Partners



NOKIA



Strategic Partners





# TEAM



## MIGUEL

CEO  
20 Anos de experiência em  
Robótica  
Eng. Eletrônico  
UNAM - Argentina



## MARTA

Co-fundadora  
Diretora Administrativa  
Phd em Serviço Social  
PUC BRASIL



## DIOGENES

Diretor de Tecnologia  
Especialista em IoT.  
Especialista em conectividade.  
Pós em Smart Cities.



## LUCIANO

Diretor de Inovação  
MsC em Medicina  
Fundador de ConceptMed  
PUC BRASIL



## ANDRE

Diretor de Relações Institucionais  
MsC. em administração pela FCU-EUA  
Especialista em gestão de negócios  
pelo IBMEC.  
PUC BRASIL

**+50 EMPLOYEES**

# Where we Are?

<http://www.instor.com.br/>









**PUCRS Ideia**  
**TECNOFUC**  
FABLab

**Foco**  
Espaço Maker para atendimento à comunidade universitária e comunidade externa.

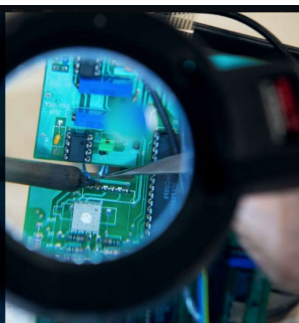
**Produtos / Serviços**  
Provas de conceito e Prototipação de ideias e projetos.  
Oficinas de Soldagem de Circuito Impresso.  
Impressão 3D.



**PUCRS Ideia**  
**LabMEC**  
LabEspecializado

**Foco**  
Desenvolvimento e execução de soluções técnicas mecânicas, apoiando os projetos ligados à universidade, empresas e startups do Tecnopuc, e sociedade.

**Produtos / Serviços**  
Desenvolvimento, montagem e teste de protótipos (Prototipagem);  
Desenvolvimento e fabricação de dispositivos e peças mecânicas;  
Usinagem em Torno Universal, Fresadora/Furadeira e Router CNC;  
Manutenção de equipamentos;  
Desenvolvimento de projetos de equipamentos, peças mecânicas e peças para impressão 3D.



**PUCRS Ideia**  
**EletroLab**  
LabEspecializado

**Foco**  
Apoio ao Ensino e Pesquisa na Universidade.  
Apoio ao desenvolvimento de processos e produtos de empresas.

**Produtos / Serviços**  
Desenvolvimento de Protótipos e Dispositivos, para validar conceitos ou experimentos;  
protótipos/dispositivos sob encomenda de empresas incubadas.



**PUCRS Ideia**  
**LabCOM**  
LabEspecializado

**Foco**  
Suporte computacional ao IDEIA. Atendimento às demandas de atividades que envolvam automação e software embarcado.

**Produtos / Serviços**  
Análise automática de imagens e obtenção de medidas por técnicas de processamento de imagens.  
Desenvolvimento de software dedicados e para o apoio a projetos de P&D e projetos de tecnologia aplicado.

# Laboratories





Obrigado!



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**PETROBRAS**

É possível fazer robótica na América Latina! Escreva esta história conosco!

