



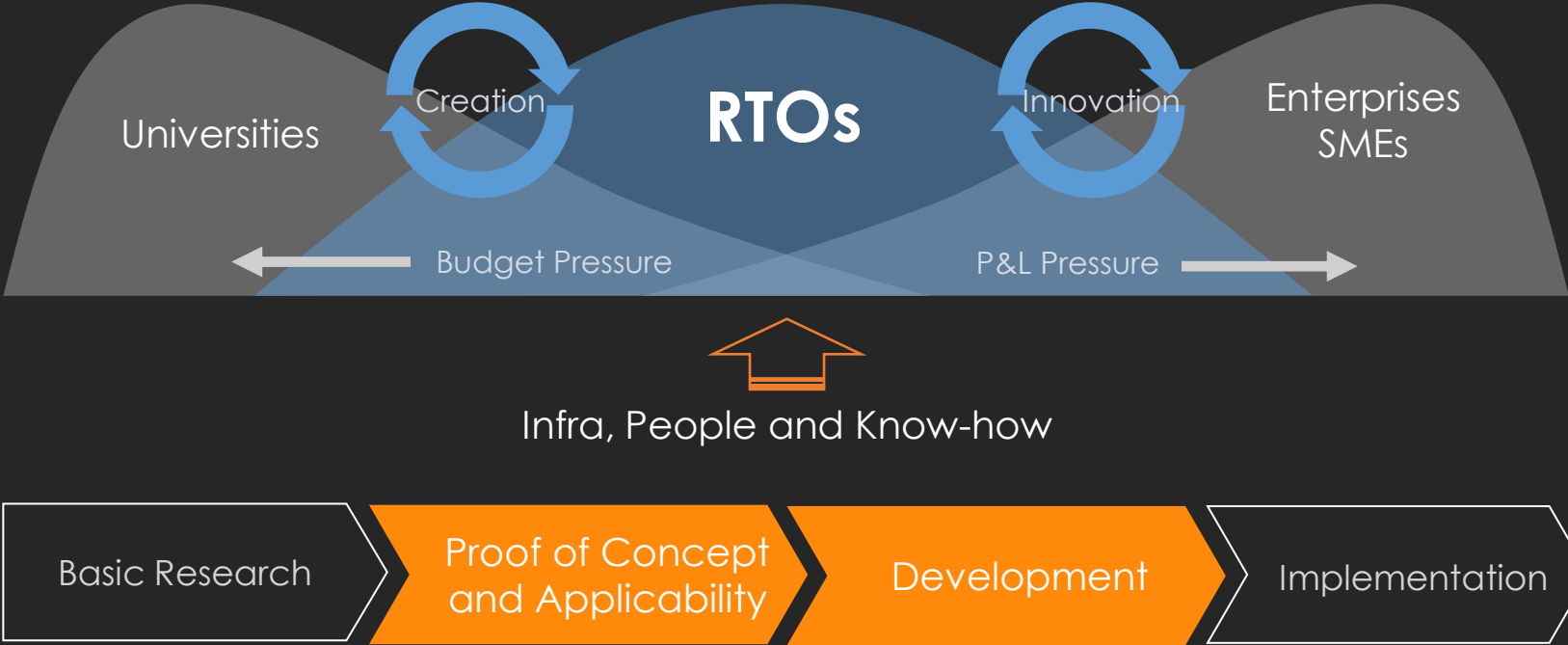
# **Turbine seu P&D**

Acelere a inovação  
com o ELDORADO





# RTOs speeding up digital transformation



# Global level





# Funding as opportunity

## Non refundable



## Fiscal incentives



## PPIs



IA / PNM



RNP / Saúde Digital



IoT / M4.0 / HW BR

## Mandatory investments



## Ready for 4.0 age!

Product Integration



Microelectronics

Cloud



Mobile & IoT

AI & Cyber



Innovation



Embedded

Design



Web & Apps

Visual Computing



Voice

Imaging



26 years providing R&D services

## Our numbers



**1,600**

employees



**\$100M**

R&D projects (24)



**75**

partners



**240**

projects / year



**16,000**

m² facilities



**#1**

ICT RTO in Brazil \*



**15 years of experience**

50+ Projects / 20+ Customers

## Integrated circuits projects end-to-end domain

- **Front End:** Digital / Verification  
Analogical / Mixed Signal / RF / Power  
DFT
- **Back End:** Physical Layout  
Sign off verification  
MEMS
- **Packaging:** Layout / Routing  
Signal Integrity / Reliability Analysis  
Prototyping / Characterization / Qualification (JEDEC)

## Technologies / Foundries

180nm | 65nm | 40nm | 28nm |  
22nm | 12nm | 6nm



imec



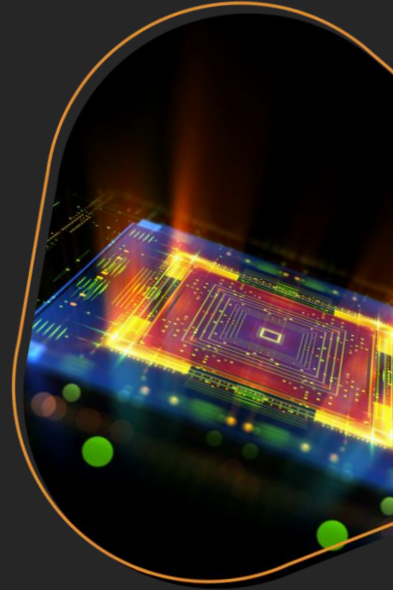
7

International  
Customers

17

Tapeouts

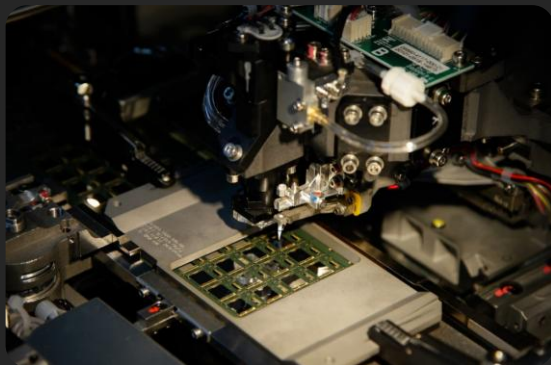
International Partners





Our facilities in

# Microelectronics



# Hardware Development



**20 years of experience in HW development**  
300+ projects / 100+ customers

## End-to-end skills and capabilities

### Multidisciplinary teams with complementary skills:

- System Engineering
- Analog and Digital Electronics
- Power Electronics
- RF / EMC
- Embedded Software

### Robust laboratorial facilities

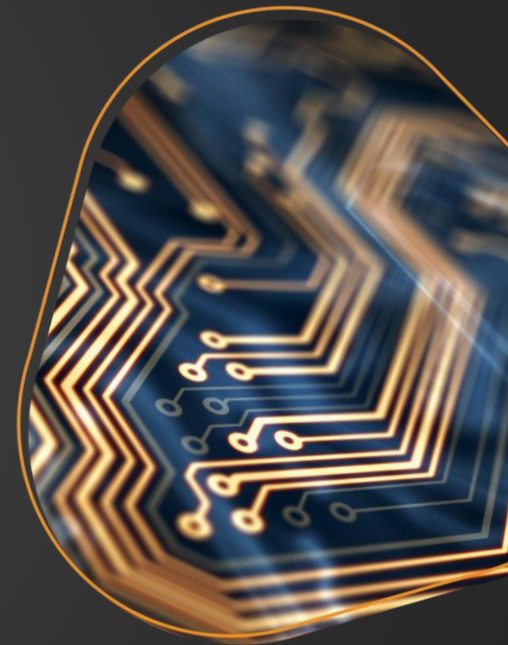
- Telecommunications, EMC, Power Electronics, Mechanical and non-destructive analysis

**40+**

Labs for development  
and certification

**90**

FTEs



Development Tools:



**Ansys**



**pads**  
powerPCB / Altium Designer

**cā dence**



**KiCad**

**PSIM**

# HW development



## HW Design meeting Partner Needs

Model-Based System Engineering

Mathematical modelling and  
linearization

Precise simulation with  
Automatic code generation

Firmware validation with  
hardware in the loop

Hardware validation by lab  
prototyping

Product validation by  
standard testing



## PCB Design

High Density

Small Pitch

Multiple Layers

Miniaturized Projects

EMC Robust Design

RF Customization



## Fit to International Standards

Complying with ISO, IEC,  
FCC, CE Mark and UL

VW80000 and TL81000  
Evaluation

Design for X Approach:  
Manufacturing, Testing,  
Reliability etc.

18

# of layers

0.1mm

Blind Vias

0.051mm

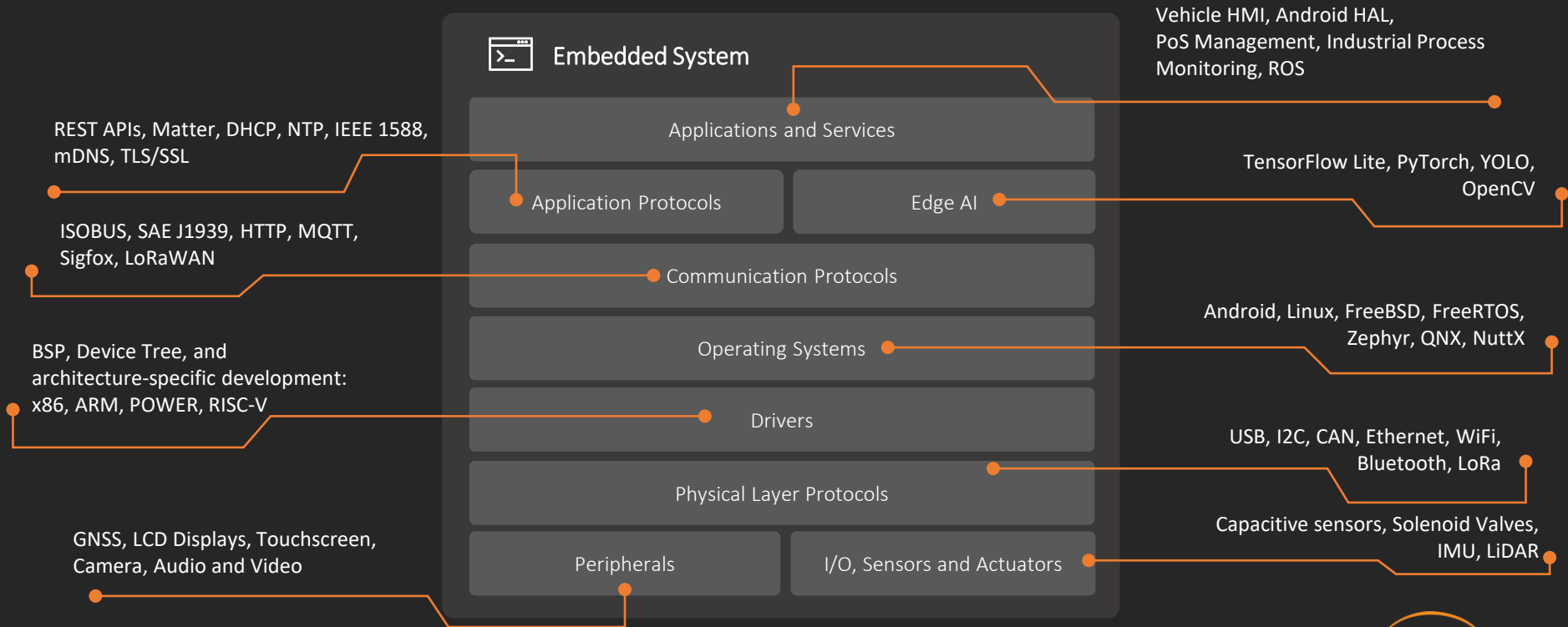
Trace Width

01005

Component size

Working on all layers

# Embedded SW

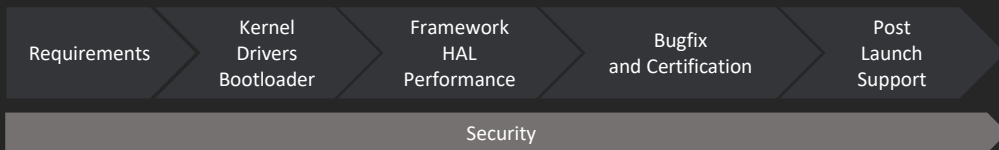






# Embedded SW - Android

## Development process and scope



## Ownership of Embedded SW enables:

- Innovation
- Fast interaction with Integration Team
- Factory and supply chain changes support
- Customer and field issues support
- Early Access (A+1)

We develop, deliver and support Android system software upgrades for a major player on the global smartphone industry

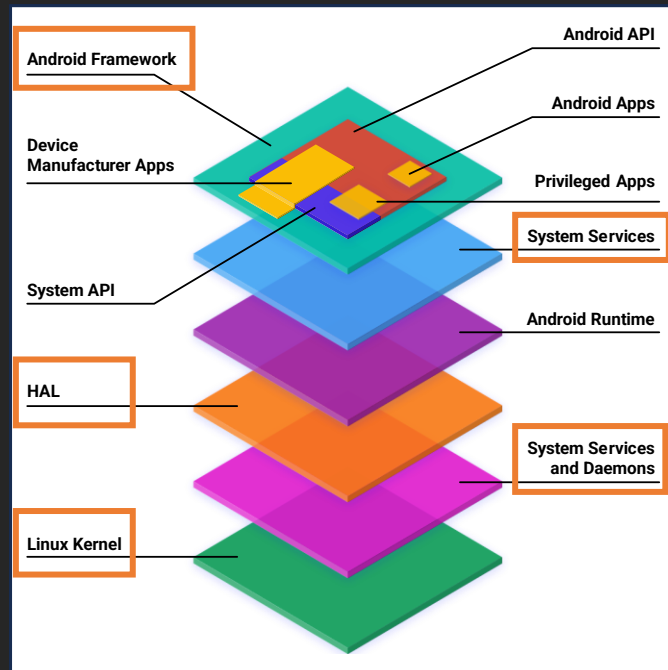


Image from [AOSP Documentation](#)

# Embedded SW



## Android OS Upgrades

Since Android 6

Ready to Android 15  
(early access)



## Working closely with

Qualcomm  
MediaTek  
Infineon  
NXP  
Toradex  
NVIDIA



## All Embedded SW layers

Kernel  
Sensors  
Connectivity  
Performance  
Cyber-security



## Architecture Experience

x86  
ARM  
Power  
RISC-V



## Operating Systems



## Know-how



## Process and Tools

CI/CD  
GIT  
Gerrit  
Jenkins  
Artifactory

490+

Open-source  
Contributions



10+ Years

Of experience with  
Embedded Software  
Development

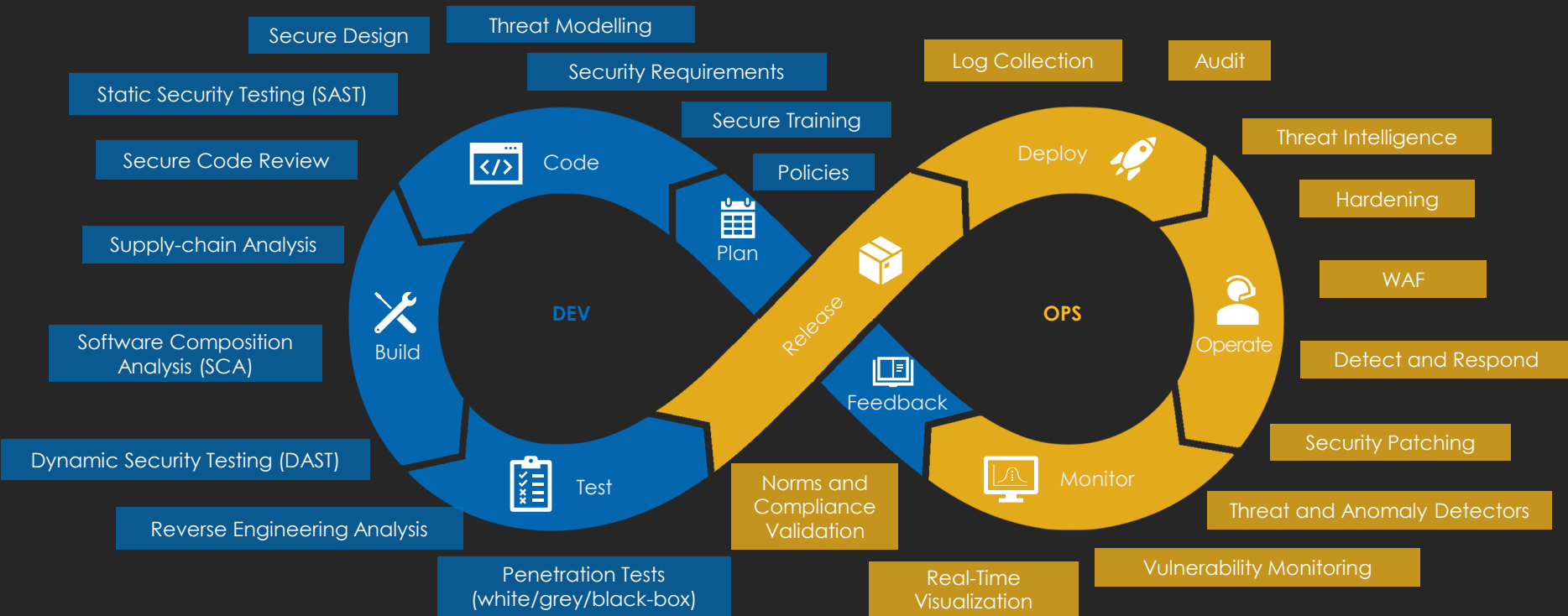
150+

FTE ELDORADO



Skills in

# Cibersecurity



Skills in

# SW application



## Software Development

Mobile Apps (Android, Automotive and iOS) and Web Apps



## User Experience

Research Flows  
Final User Interface  
University Partnership



## Architecture Design

High Transition  
Volume  
Flexibility  
Security



## Cloud Infrastructure

Serverless  
Multi-cloud



## Quality Assurance

Software Verification  
Software Validation



## Work Process

CI/CD  
Devops  
Security by Design



## Machine Learning Models

Data  
Image  
Sensors

20+

Years of experience  
with SW application  
development

500+

FTE ELDORADO



Skills in

# SW application



## Cloud | Infra | DevOps

AWS | Azure | Google Cloud

Cloud Hosted | Cloud Native

SaaS | MaaS (ML)

Docker | Kubernetes

Terraform | CloudFormation

CI/CD | Bitbucket | Jenkins

CloudWatch | Kibana | FluentD

Elasticsearch



## Web Apps | Backend | Frontend

Java | Spring Boot

Angular | React

ASP Net | .Net Core

React Native | WPF

Entity Framework

Angular Material

Node | NestJS

Bootstrap

JUnit | NUnit | XUnit

Design System



## Mobile Apps

Android | iOS | Auto

Kotlin | Flutter  
React Native



## Data Science

Machine Learning

Deep Learning

NLP

OCR

MLOPs



## Design

UX/UI | Ideation | Design  
Thinking



Skills in

# Camera & Image



Global Camera Development end to end solution

## Lab

Image Validation & QA

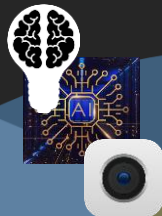


**7** global labs

world wide reference with DXO and VCX partnership

## AI & ML

Algorithm & SW Dev Integ.



**+0.8** million

images on database for ML study and AI development

## R&D

State of Art



**4** universities

partnership to develop State of Art algorithms and overall imaging technology

## SW Dev

Camera Embedded, Bring up/  
Quality Management



**83** products

with different Chipset and SW solutions deployed in the Market



Skills in

# Visual Computing



## Image Processing

Camera ISP Pipeline  
AI Models & Datasets for  
low level image tasks



## Computer Vision

AI Models & Datasets for  
classification, detection, tracking, ...  
Use of synthetic data



## Digital Realities & Spaces

VR/AR/XR  
Metaverse  
Digital Twins



## Surveillance & Safety

People and vehicle tracking  
Electronic fencing  
Process visual monitoring  
Human behavior analysis



## Automation

OCR (printed and displayed)  
Custom barcode readers  
Non-rigid product counting  
Food goods classification



## Quality Inspection

Electronics boards defects  
Assembled products  
Screws, cables, connectors  
3D parts

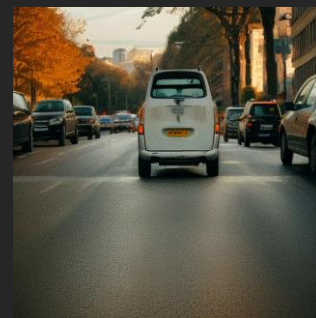
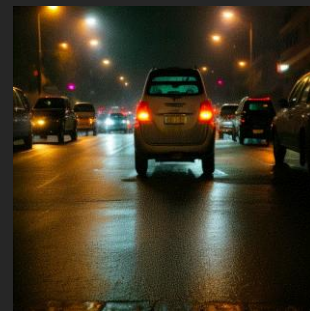
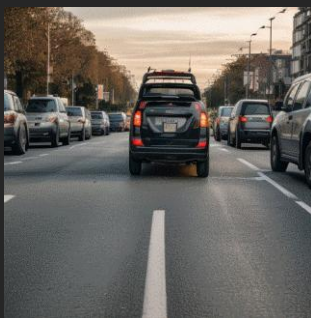
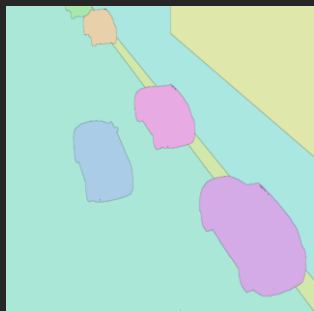
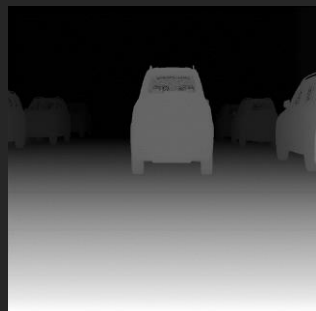


## Extended Reality

Immersive training  
Virtual product experience  
AR product usage guidance

# Generative AI for ADAS

- Generative AI applied to cover corner cases in ADAS training and validation in video injection
- Real image customization (eg: changing weather)
- Image creation from simple 3d scenes (eg: dangerous braking)
- Image to video transformation
- ML skills as GAN, Diffusion and Optical Flow





# Real time video analytics

## Challenges:

- Embedded AI used for automotive safety area. The idea is to monitor the attention and actions of the truck driver, applied AI in the cameras inside truck cockpit.
- AI Model Optimization in order these models could leverage HW acceleration, reaching 10x more performance.



## Tech Detail :

- skills : ML, deep learning, NN, visual computing and embedded systems
- Platform: NVIDIA Jetson Orin Nano (4 e 8 GB) , NVIDIA TensorRT
- Code originally required 3 CPUs Intel, after Eldorado optimization work now runs in 1 Jetson (1 CPU + 1 GPU)
- Improve in performance of 10x
- VC Features : Facial Recognition , Sleepiness detection , forbidden action detection(smoke), Environment monitoring (speed, object and dangerous situations detection and warning)



# Product Integration and Validation



## SW Upgrades

- Operating System Updates
- Deployment (OTA packages)

## User Feedbacks

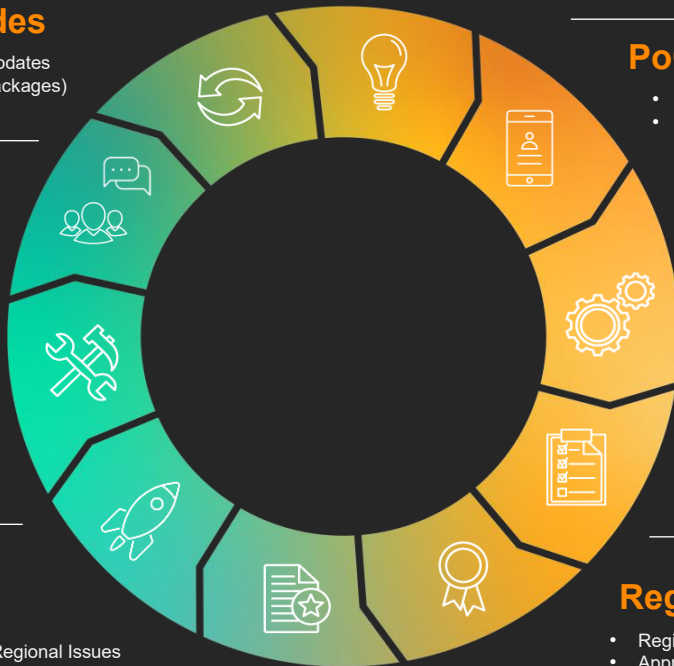
- Post-Launch Analysis
- NPS and User Satisfaction

## Field Maintenance

- Deployment (OTA packages)
- Software Maintenance and Security

## Market Launch

- Deployment (new products)
- Compliance with Factory and Regional Issues



## PoC/MVP

- HW & SW Integration
- Features, 3rd Party Apps, Components

## Dev & Tools

- Defect and Customization Management
- Support for Trials and Testing

## Tests and Automation

- Product Testing and Lab Trials
- User Trial and User Experience
- Metrics and KPIs

## Regulatory / Certifications

- Regional Product Certifications
- Approval with Regulatory Agencies

## Homologation

**300+**

FTE ELDORADO

**10+**

Years of Expertise in  
SW integration

**~50M**

Users / Month

**140M+**

Active Users

**70TB**

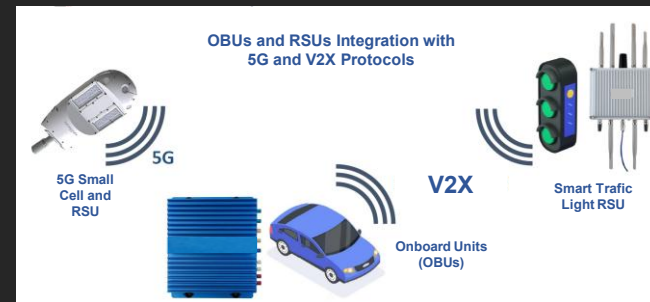
Data Pipeline

Skills in

# V2X – Connected Route

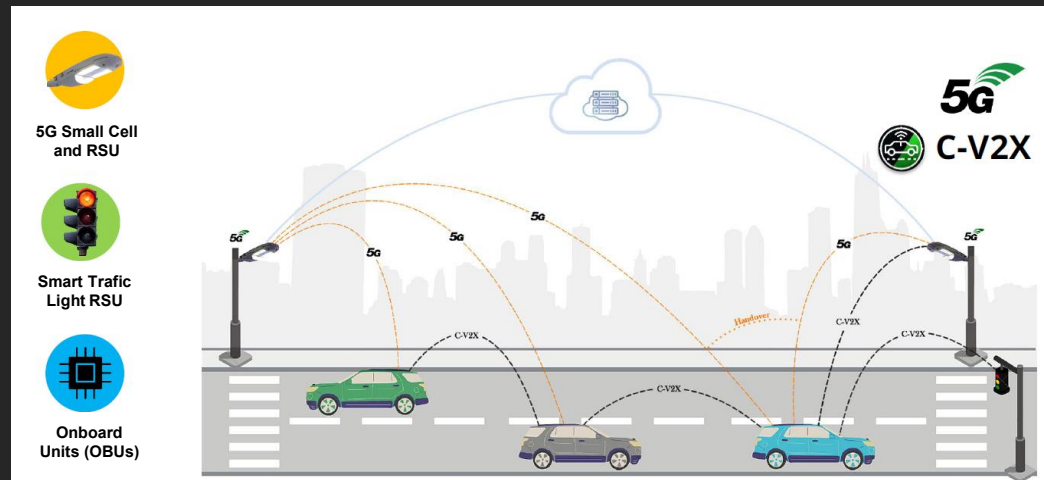
- Vehicle Connectivity Environment for Advanced Mobility Research:

- Testbed environment
- Vehicle Connectivity Testing and Prototyping
- 5G & C-V2X connectivity
- Eldorado + Universities + Automotive Companies



- Connectivity Prototyping Lab

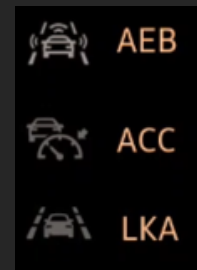
- Internal environment for 5G and V2X R&D
- Experiment cases in Lab before deployment in production
- Development of applications and applied use cases



# HiL Test Automation

- **ADAS Project:**

- HiL scripts automation validation on HiLs:
  - ADAS functionalities validation: ACC, AEB & LKA
  - ECU & environment validations: Diagnostics, Cybersecurity
- Video & Data Acquisition Assistance for HiL testing



- **HiL Prototype Lab:**

- HiL Validation: PoC of Cluster Calibration (Vector HiL, CANoe, VTestStudio);
- Simulation: CARSIM Simulator (VirtualCAE)
- Training, Events, Technologies:
  - Matlab/Simulink & Model Base Design (MDB);
  - XiL (HiL, SiL, MiL)
  - Automation: Vector (CANoe, CANalyzer), Python
  - Road to Zero Prototype (VI-Grade)

