



ELLEA

INGEGNERIA



AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

“...let's not make things any worse by guessing”

*“Gene Kranz”
NASA Flight Director*

ENGINEERING CONSULTING COMPANY

Twenty years of Experience in Design & Virtual Simulation

AEROSPACE



AUTOMOTIVE



POWERTRAIN



RAILWAY



AEROSPACE

CONCEPT & DESIGN DEVELOPMENT

- Wings
- Fuselage
- Empennage
- Tailgates
- Landing Gears

STRUCTURAL VERIFICATION & VALIDATION

- FE Model Build & Analysis
- Fatigue & Damage Tolerance
- Hand Calculation
- Certification Report
- Production Assistant (MRO&Concessions)

FLIGHT CERTIFICATION

- Residual Strength Analysis:
 - Wing Fuselage
- Full Scale Static, Fatigue Test:
 - Test Loads discretization
 - non-destructive testing
 - Certificate Report

CUSTOMERS (TIER 1&2)



AUTOMOTIVE

CONCEPT & DESIGN DEVELOPMENT

- Style Feasibility
- Body & Closures
- Exterior Trim
- Production Technology : Plastic, Metallic

STRUCTURAL VERIFICATION & VALIDATION

- FE Models Determination & Validation
- Static & Stress strength analysis

SAFETY

- Front, Side & Rear Crash: EuroNCAP
- Bumper Low-Speed Impact: ECE42
- Interior Head impacts: ECE21

CUSTOMERS (TIER 1&2)



POWERTRAIN

CONCEPT&DESIGN DEVELOPMENT

BASE ENGINE

- Cylinder Head
- Engine Block
- Intake & Exhaust
- Water Pump & Circuit

ENGINE SYSTEM

- Refueling System
- FLVV Valve & MFI Modules
- Diesel & Adblue Tanks
- Connector & Pipe lines

STRUCTURAL VERIFICATION&VALIDATION

- Multibody Analysis
- FEA & Noise Vibration Harshness
- Fatigue & Durability (FRF & PSD)
- Biphasic CFD Analysis
- Preliminary Shut Off
- De-Icing Prediction

HANDLING, COMFORT&PERFORMANCE

- Axle Whine
- Isolation Effectiveness
- Engine Excitation Boom
- Prop Shaft Out of Balance
- Vibration Absorber
- Radiated Noise

CUSTOMERS (TIER 1&2)



PORSCHE



MECHANICAL DESIGN TOOL SKILLS

MAIN SOFTWARE

CATIA V5

UG NX

ONSHAPE

CREO



RAILWAY

CONCEPT & DESIGN DEVELOPMENT

- Carbody Structure (Bodyshell)
- Interior & Exterior case trim
- Equipments case
- Bogie
- Anti-roll and anti-shake systems
- Electrical & Hydraulic systems
- Lubricating systems and Sanding device
- W & G

STRUCTURAL VERIFICATION & VALIDATION

- Virtual Simulation
- FEA & Manual Calculation
- Certificate report

European Regulations: EN: 12663,1993 ,1999

RAILWAY & TRAM CART

- High-Speed train
- Underground Train
- Tramway Train

CUSTOMERS (TIER 1&2)



BOMBARDIER
TRANSPORTATION



KNORR-BREMSE

VIRTUAL SIMULATION TOOL SKILLS

MAIN SOFTWARE

STRUCTURE | MBS & NVH

- NASTRAN
- OPTISTRUCT
- ADAMS
- ABAQUS

DURABILITY

- VIRTUAL LAB
- FEMFAT
- HAND CALCULATION

SAFETY

- ABAQUS EXPLICIT
- RADIOSS

CFD

- FLUENT
- ACUSOLVE



ELECTRONIC DESIGN TOOL SKILLS

MAIN FIRMWARE TOOLS

IAR EMBEDDED WORKBENCH



IAR Embedded Workbench

KEIL UVISION5



STM32CUBEMX & IDE



CODEWARRIOR



MPLAB X IDE



MAIN SOFTWARE TOOLS

VISUAL STUDIO C#-BASIC



LAB WINDOWS/CVI



ELECTRONIC DESIGN TOOL SKILLS

MAIN HARDWARE TOOL

ALTIUM DESIGNER

Altium
Designer.

MAIN CIRCUIT SIMULATION TOOL

LTSPICE BY ANALOG DEVICES



AHEAD OF WHAT'S POSSIBLE™

MAIN THERMAL SIMULATION TOOL

MENTOR GRAPHICS FLOTHERM XT

SIEMENS

PARTNERSHIP

From 2023 Ellea Ingegneria and Cielle-Tronics become strategic partners

ELLEA INGEGNERIA



MECHANICAL DESIGN
MECHATRONIC DESIGN SYSTEMS
VIRTUAL SIMULATION & VALIDATION
PROJECT MANAGEMENT

CIELLE-TRONICS



HARDWARE & SOFTWARE DESIGN
ELECTRONIC PROTOTYPING SYSTEMS
ELECTRONIC PRE SERIES PRODUCTION SYSTEMS
AUTOMOTIVE LIGHTING DESIGN (OPTICS & PLASTIC PARTS)



AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

COMPANY DIVISION

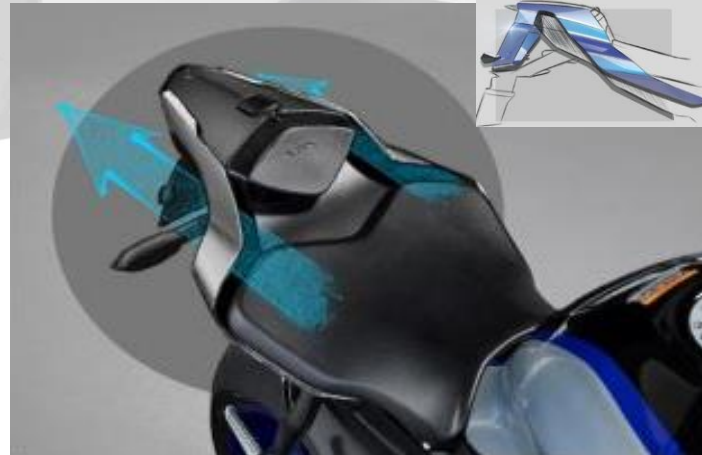
From 2022 Ellea Racing is a new Company Division focused in R&D:

SUPERCAR CONCEPT DESIGN



STYLE RESEARCH
3D CONCEPT DESIGN
3D MODELING
FEASIBILITY

AERODYNAMIC DESIGN COMPONENT



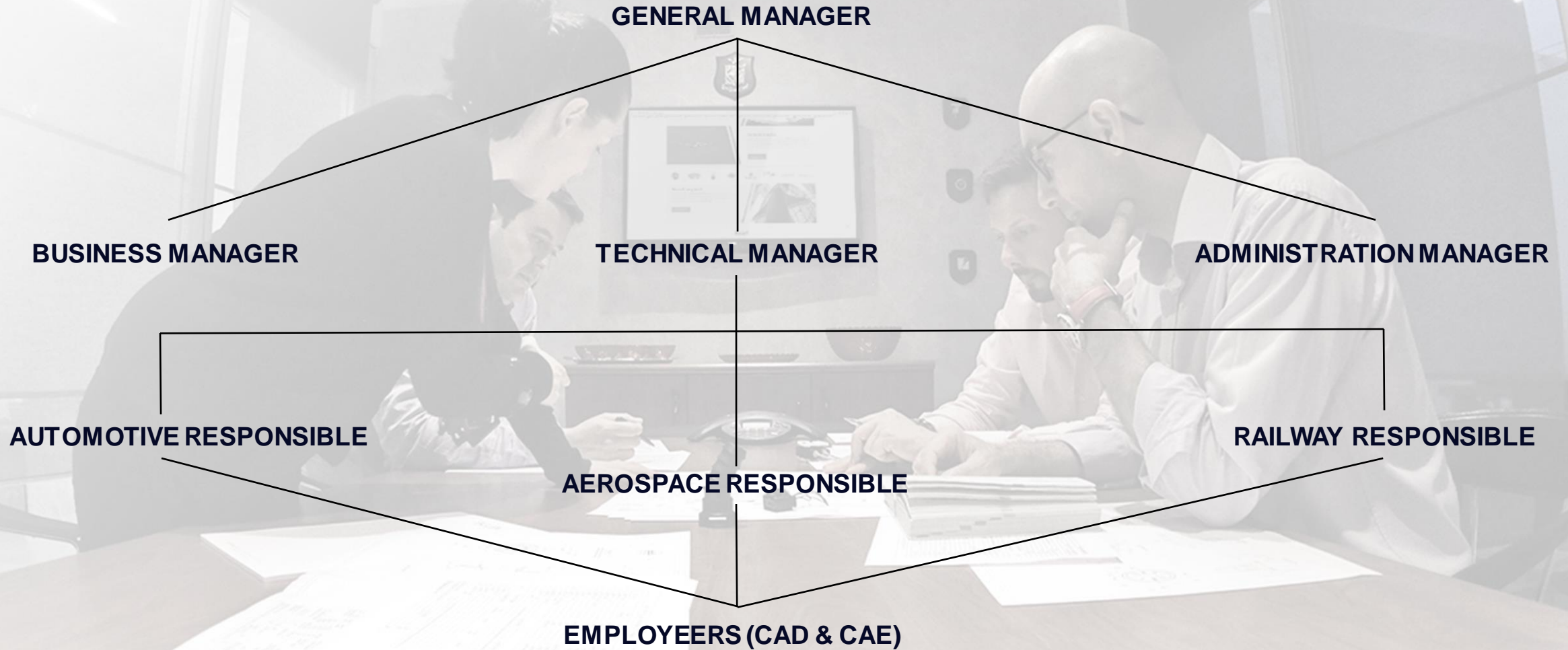
STYLE RESEARCH
3D CONCEPT DESIGN
VALIDATION ANALYSIS
PROTOTYPING & TESTING

ADAS SYSTEMS - MOTORBIKE



COMPONENT DESIGN RESEARCH
FIRMWARE & SOFTWARE DESIGN
PROTOTYPING & TESTING

COMPANY CHART



BUSINESS MODEL

INDUSTRY FOCUS

Aerospace, Automotive, Powertrain, Railway

STRATEGY

Market & Product adaptation

Pick Up and Shift

Global Product & Service

Local Resources Execution

Remote Resources Execution

SERVICE

Best in class delivered through

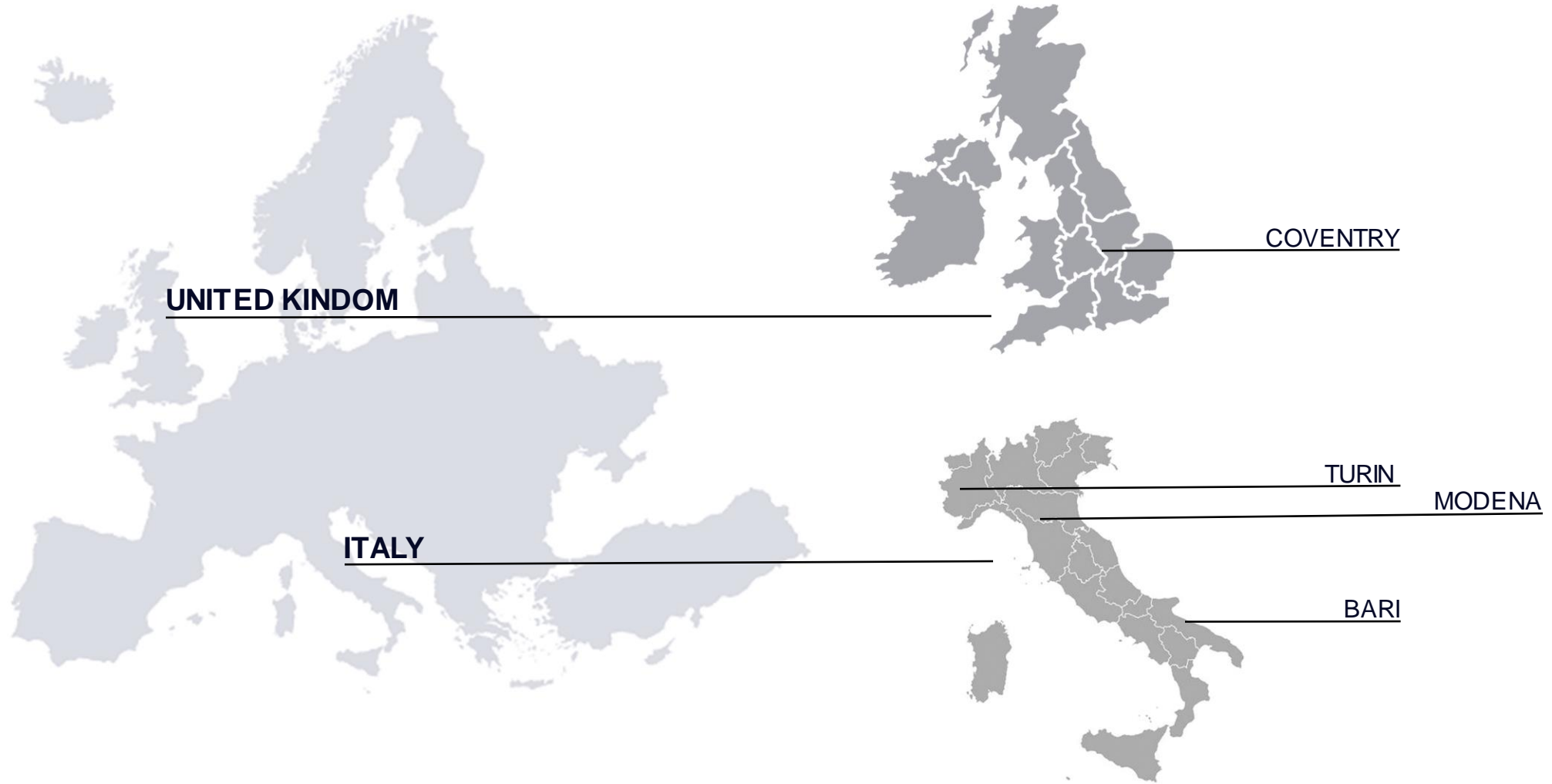
Flexibility

Efficiency

Readiness

Competitiveness

LOCATIONS



AUTOMOTIVE

SPECIFIC SKILLS

AEROSPACE

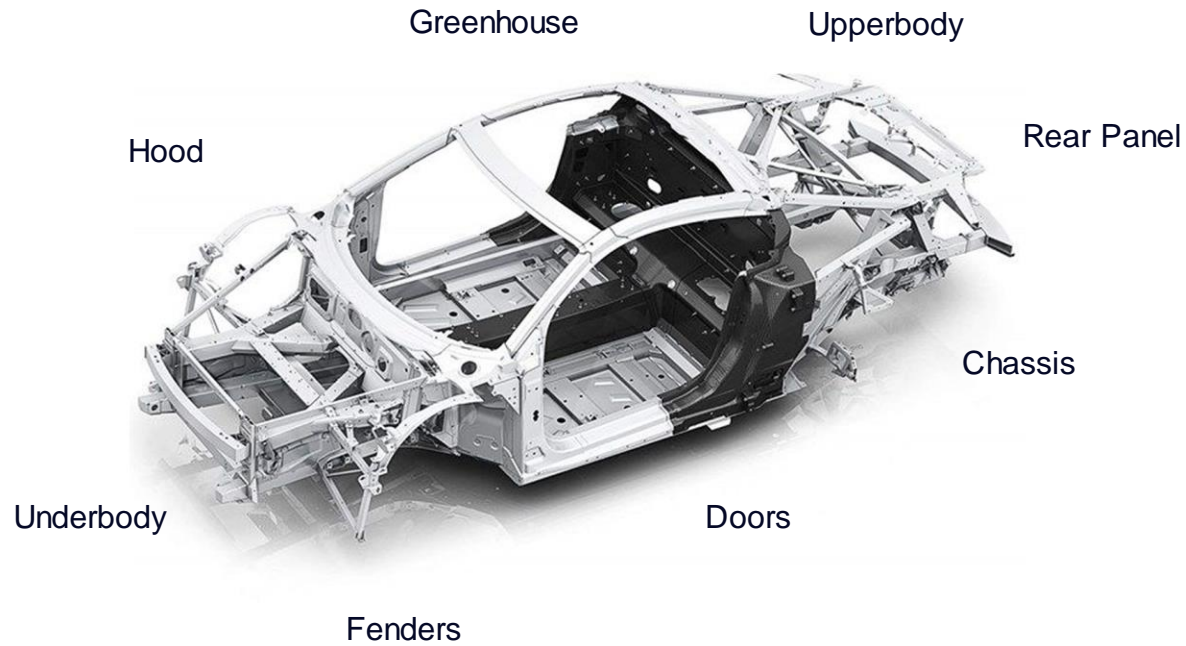
AUTOMOTIVE

POWERTRAIN

RAILWAY

SPECIFIC AUTOMOTIVE SKILLS

BIW & CHASSIS

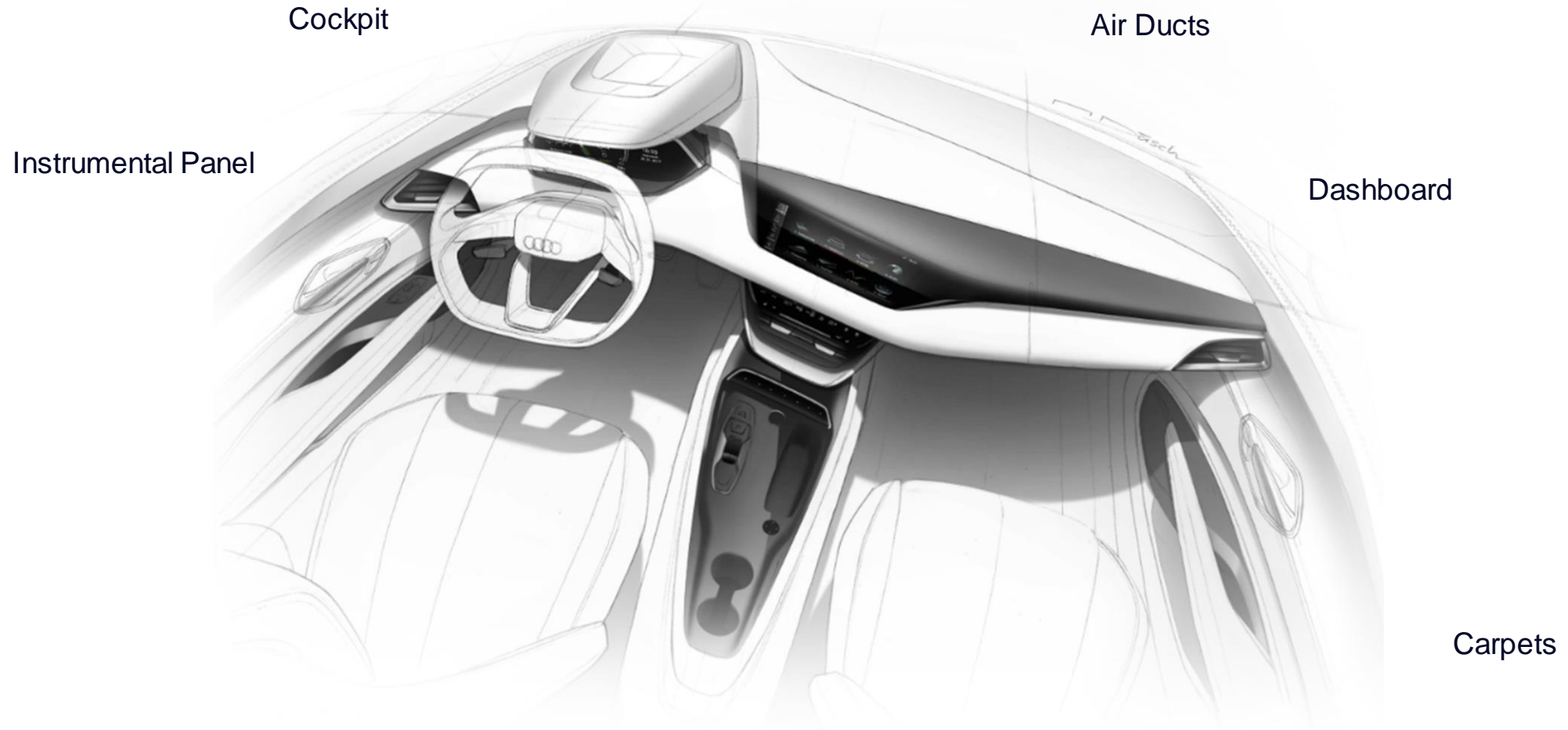


EXTERIOR TRIM



SPECIFIC AUTOMOTIVE SKILLS

INTERIOR TRIM



SPECIFIC AUTOMOTIVE SKILLS

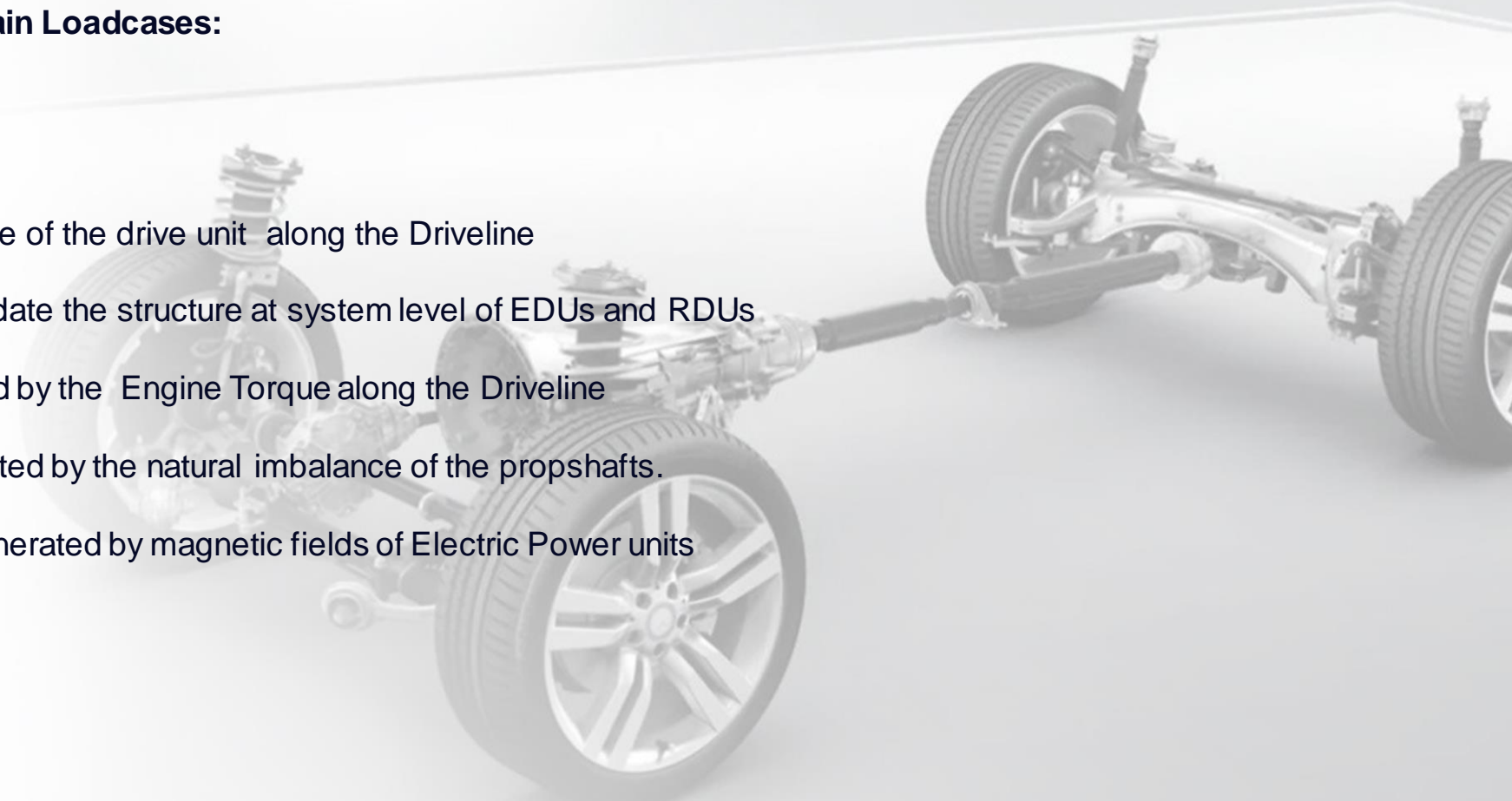
SUSPENSIONS

- Analysis of Metallic and Plastic Components
- Formability Virtual Simulation
- Assembly Process to account for Initial Stress State
- Virtual Simulation of Testing Conditions for Strength, Stiffness and Fatigue Evaluation
- Frictional Contact Simulation between components for correct load transfer

SPECIFIC AUTOMOTIVE SKILLS

DRIVELINE

Dynamic Analysis in Frequency Domain Loadcases:

- **Axle Whine:** generated by gear whine of the drive unit along the Driveline
 - **Isolation Effectiveness** used to validate the structure at system level of EDUs and RDUs
 - **Engine Excitation Boom:** generated by the Engine Torque along the Driveline
 - **Prop Shaft Out Of Balance:** generated by the natural imbalance of the propshafts.
 - **Radiated noise (ERP and SPL):** generated by magnetic fields of Electric Power units
- 

SPECIFIC AUTOMOTIVE SKILLS

FATIGUE ANALYSIS

- Endurance Fatigue Evaluation from Dynamic FRF Analysis
- Damage Evaluation from Fatigue Spectrum Analysis
- Endurance Fatigue Evaluation from PSD Analysis



SPECIFIC AUTOMOTIVE SKILLS

ENGINE SYSTEM

Design & Virtual Simulation :

Transversal management of programs that encloses the assistance and the support to the suppliers during testing phases and product final validation.

Experience :

Fuel System Static Analysis:

- General Property at Project Condition*
- Ventilation Analysis: Valve Position Check*

CFD Virtual Simulation of Refueling:

- Preliminary Shut off*
- Splash back & Spit Back*

SPECIFIC AUTOMOTIVE SKILLS

BOARD CHARGING

Design & Virtual Simulation :

Transversal management of programs that encloses the assistance and the support to the suppliers during testing phases and product final validation.

Experience :

- Product Development
- Stack Up Analysis
- Air Creepage Analysis
- Static & Fatigue Analysis
- CFD & Thermal Analysis
- Transient Linear Analysis
- Random Vibration Analysis

SPECIFIC AUTOMOTIVE SKILLS

ELECTRONIC DESIGN & PROTOTYPING

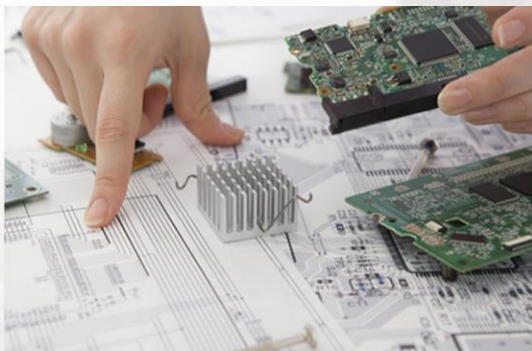
- Full Design and Construction of Electronic Equipment, advanced technological solutions
- Prototyping of Electronic boards and Mechatronic devices for the Automotive Industry
- Customer support for industrialization, pre-production and mass production
- Modifications and testing for electronic and mechatronic equipment
- Reverse Engineering, for equipment and electronic boards
- Hardware, Firmware and Software design develop and support
- Schematics and Layouts for Multilayer PBC development
- Data acquisition and telemetry systems

SPECIFIC AUTOMOTIVE SKILLS

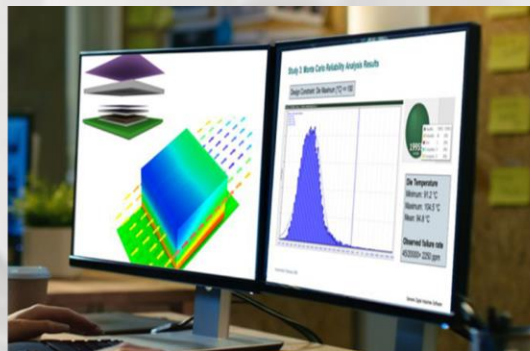
ELECTRONIC DESIGN & PROTOTYPING

APPLICATIONS

Advance Board Development



Thermal Analysis



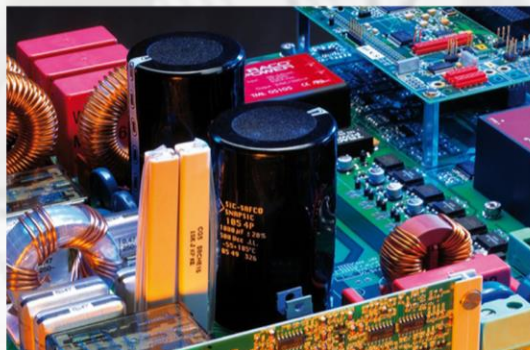
ECU Development & Testing



Mechatronic Devices



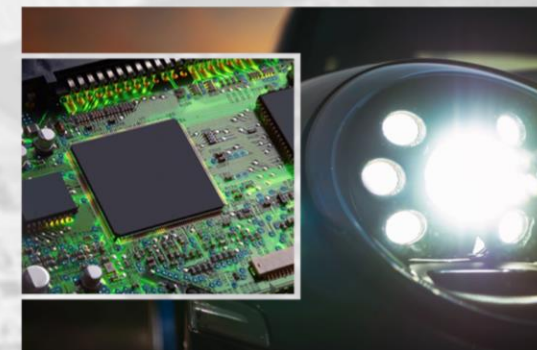
Micro Sensor



Power Electronics



Display Panel



Led Light

SPECIFIC AUTOMOTIVE SKILLS

STYLE RESEARCH

- Analysis & Concept
- Proposal Sketch Research
- 2D Rendering

STYLING

VIRTUAL 3D MODELING

- Modeling Study process (C-B Class)
- 3D Rendering Visualization

SOFTWARE

PHOTOSHOP
2D Rendering



ALIAS AUTOSTUDIO
3D Modeling



V-RED PRO
Visualization



AUTOMOTIVE

CASE HISTORY

AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY

MAGNETI MARELLI – SUSPENSION SYSTEM - 2012 -

STRESS

- FE modelling and analysis with material and geometry (contacts) non linearities of entire dampers and single components, both metallics and plastics, for structural verification (stiffness, static and fatigue strength); reporting
- Forming simulations of metallic brackets for stress state evaluation state due to mechanical processing and that affects the endurance of the component
- Reverse engineering (3D Scan and CAD creation)

FINAL CUSTOMER



FERRARI GTC4 **- from 2013 to 2014 -**

DESIGN

- Body design
- Design of interior and exterior trims
- Doors Panels
- Dashboard
- Feasibility, design and development of the central console, cockpit and central tunnel

FINAL CUSTOMER



FERRARI 488

- 2013 -

DESIGN

- Body design
- Design of interior and exterior trims
- Doors Panels
- Dashboard

FINAL CUSTOMER



Ferrari

FERRARI F12 BERLINETTA

- 2011 -

DESIGN

- Body design
- Design of interior and exterior trims
- Doors Panels
- Dashboard

FINAL CUSTOMER



LAMBORGHINI HURACAN

- from 2012 to 2013 -

DESIGN

- Body design
- Design of interior and exterior trims
- Doors Panels
- Dashboard

FINAL CUSTOMER



AUDI TT - 2013 -

DESIGN

- Body design
- Design of interior and exterior trims
- Doors Panels
- Dashboard

FINAL CUSTOMER



MINI COOPER - 2014 -

DESIGN

- Body components design

FINAL CUSTOMER



IRISBUS 18m SERIES

- from 2001 to 2003 -

DESIGN

Development program that encloses the assistance and the support to the suppliers:

- Chassis
- Wheels Arch

STRESS

Chassis and Wheels Arch fatigue simulation:

- FE model check and modifications
- Panels FEM validation and test correlation
- Reports

FINAL CUSTOMER

IVECO
BUS

IVECO DAILY D-EV SERIES

- Work in Progress -

DESIGN

Development program that encloses the assistance and the support to the suppliers:

- Elements and structures implementation on the Chassis
- Implementation and creation of different system : fuel, exhaust, cooling, air conditioning
- Implementation on fuel tanks
- Hydro cell study, Installation and fixing system
- 2D drawings of different elements , assemblies and layout

FINAL CUSTOMER

IVECO

THANK YOU

ELLEA Ingegneria Srl

www.elleaing.com

<https://www.linkedin.com/company/ellea-ingegneria-srl>



ELLEA
INGEGNERIA



AEROSPACE

AUTOMOTIVE

POWERTRAIN

RAILWAY