

**High-Speed, Safety-Critical
Autonomous Driving:
How Accurate Vehicle Dynamics Simulation
Enable Autonomous Highway
Edge Cases Management**



High-speed scenarios

1 Decisions are made in fractions of a second

2 Limit of Vehicle Dynamics
Grip saturation



Tesla FSD shows clear limitations in poor lighting conditions



Traditional Electronic Stability Control (ESC): not context aware



Example of an Edge Case on Autobahn (no speed limit)

Autonomous vehicles on highways MUST be capable of dealing with edge-case, safety-critical scenarios.



What we do: edge case autonomy

1

Engineered for human safety

Built to protect lives by bringing expert-level driving performance into everyday scenarios.

2

Trained at the limit

Developed at 80–100% grip, where all autonomous systems fail.

3

Optimized for the unexpected

Designed to handle critical edge cases at 120+ kph





This is where **we step in**

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**40.000
KILOMETERS**

**OF HIGH-SPEED
AUTONOMOUS TESTING**



8 +

**YEARS OF
EXPERIENCE**



**A GLOBAL
NETWORK**

**UNIVERSITIES AND
R&D CENTERS ACROSS
15 US STATES AND 11
COUNTRIES**





Our approach

TEST



**HIGH-SPEED
TESTING**



SIMULATE



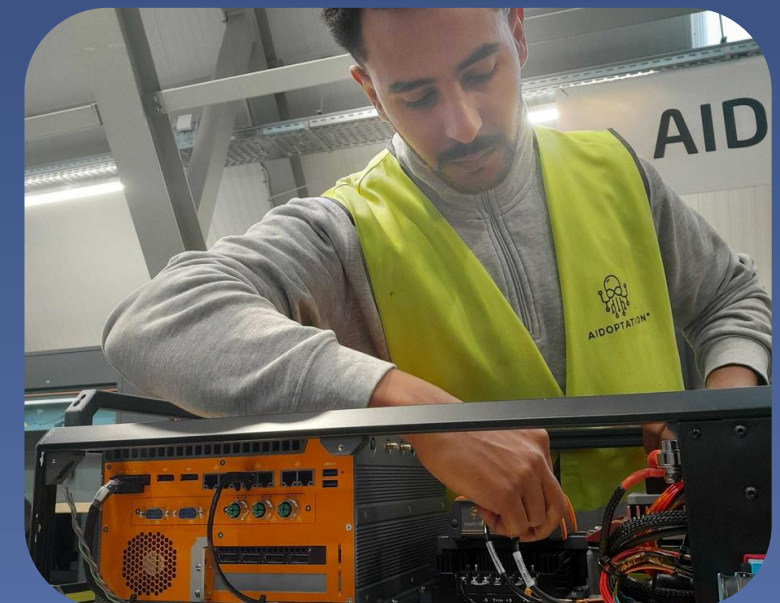
**ADVANCED VEHICLE
DYNAMICS SIMULATION**



INNOVATE



**CONTINUOUS
INNOVATION**





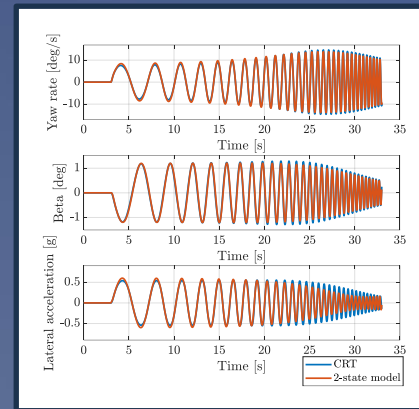
Our approach

Data collection

Model fitting and validation

Accurate vehicle and tire modelling

VI-CARREALTIME
SIL simulator



VI-GRADE
HIL simulator

- EuroNCAP-inspired scenario definition for tailored for AV
- 1000+ Safety-Critical high-speed scenarios
- Grip variation

- Advanced simulations of complex scenarios
- Human/Autonomous software interaction
- Autonomous Handling-limit maneuvers



- Real world testing and validation
- Edge Case testing on proving ground

Real world

Simulation

Real world



Proving our technology

Testing in Racing circuits (**limit handling autonomous driving**) and **avoidance maneuvers** in proving ground (Lommel Proving Ground LPG)

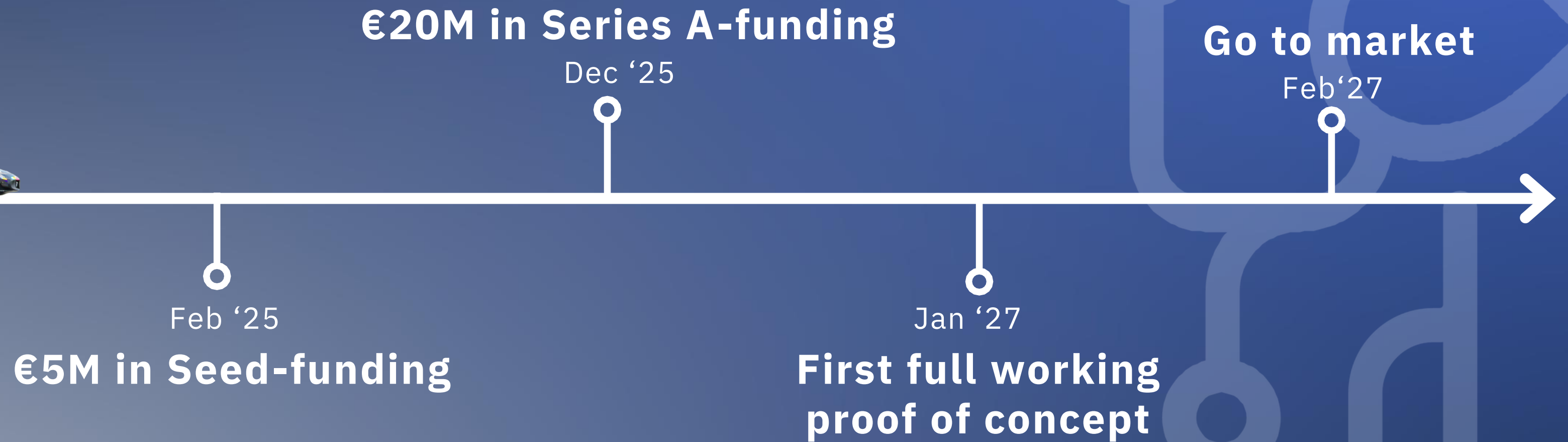


Autonomous land speed record of **197.7 mph (318 km/h)** in the **Maserati MC20 Coupe** at Kennedy Space Center, Florida.





Funding & Business milestones



Thank you for your attention

Aidoptation's mission continues forward,
with each goal driving the next.

