Introducing

A new groundbreaking CAE solution for Vehicle Design applications

The Players

AUTO RESEARCH CENTER

Automotive Engineering R&D, Wind Tunnel, 7-Post & Gearbox Rig

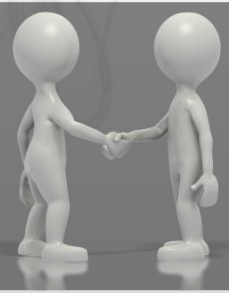
ARC
AUTO RESEARCH CENTER

ENGYS

CFD Engineering, Open Source Software Development, User Support

engys

Joint Venture



STREAMLINE SOLUTIONS

ARC and **ENGYS** unique combination of automotive engineering resources and CAE software development expertise

The Concept

Software suite satisfying the needs of styling, engineering and management

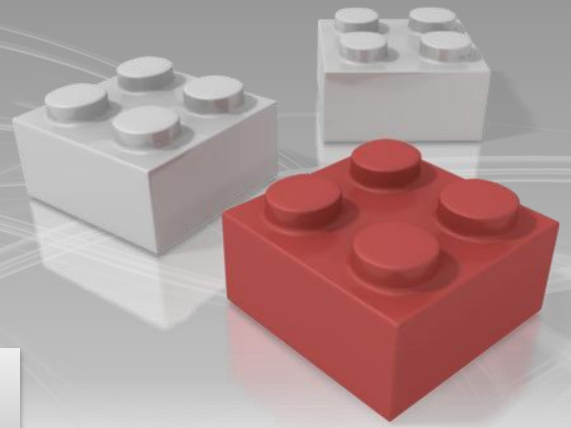
Advanced Graphical User Interface (GUI) for ease-of-use

Embedded best practices for best-in-class vehicle design simulation

First-class user support and extensive written documentation

Modular program architecture for fast expansion and development

Open Source CFD engine based on OPENFOAM® Engys Edition



The Strategy

Open Source CFD Methods Development

Best Engineering Simulation Practices

GUI for Automotive Applications

Experimental Correlation & Validation

engys

ARC AUTO RESEARCH CENTER

The Advantages

Integrated Solution
Design, simulation, optimisation & visualisation

Cost-effective
Reduce software and product costs

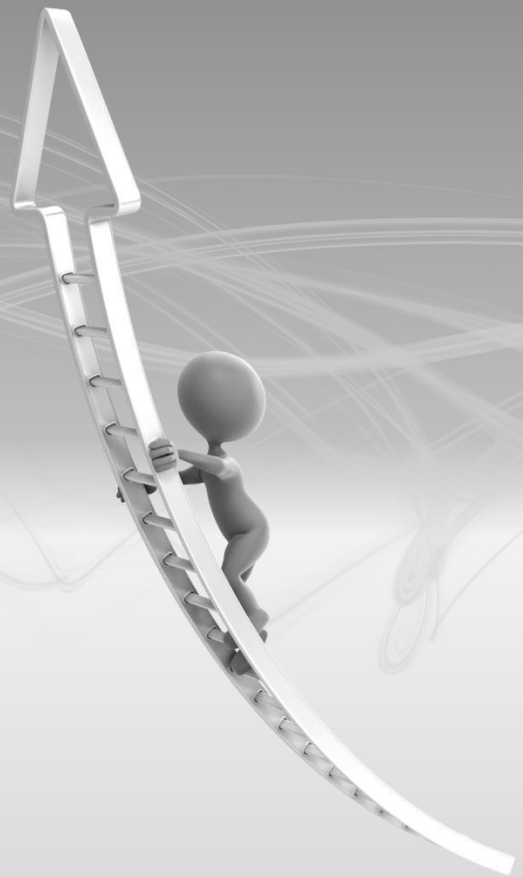
Highly Scalable
No solver license = unlimited parallel execution

Well Validated and **Broadly Used**
Extensive use for automotive CFD simulations

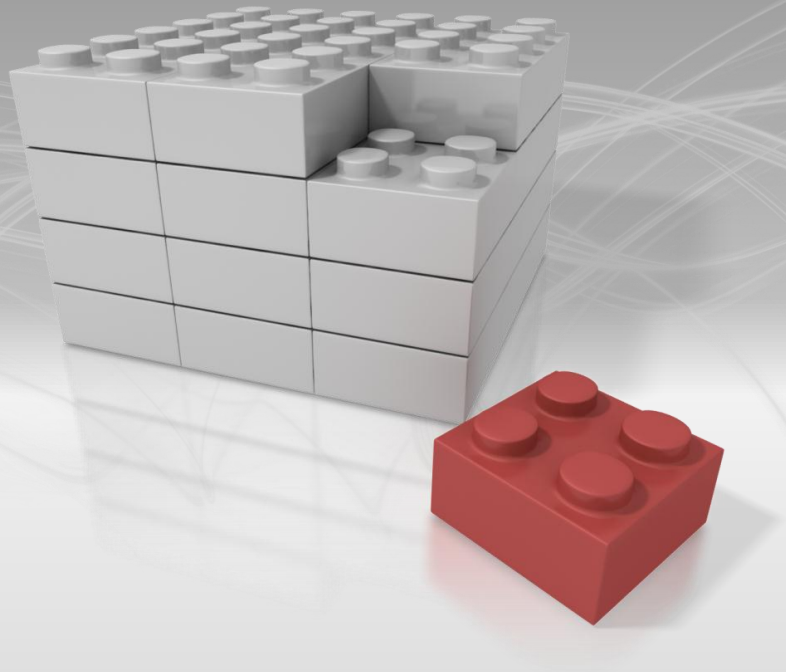
Zero Liability
Professional LLC setup to eliminate software liability

Customisable and **Verifiable**
Fully-transparent, fast on-demand customisation

OPEN SOURCE Software Platform



The Product



CAD, **Styling** and **Surface Morphing**
CAD preparation, conceptual aero design

Case Manager
Manage large datasets, multiple cases

DOE and **Optimisation**
Design of experiments, advanced MDO tools

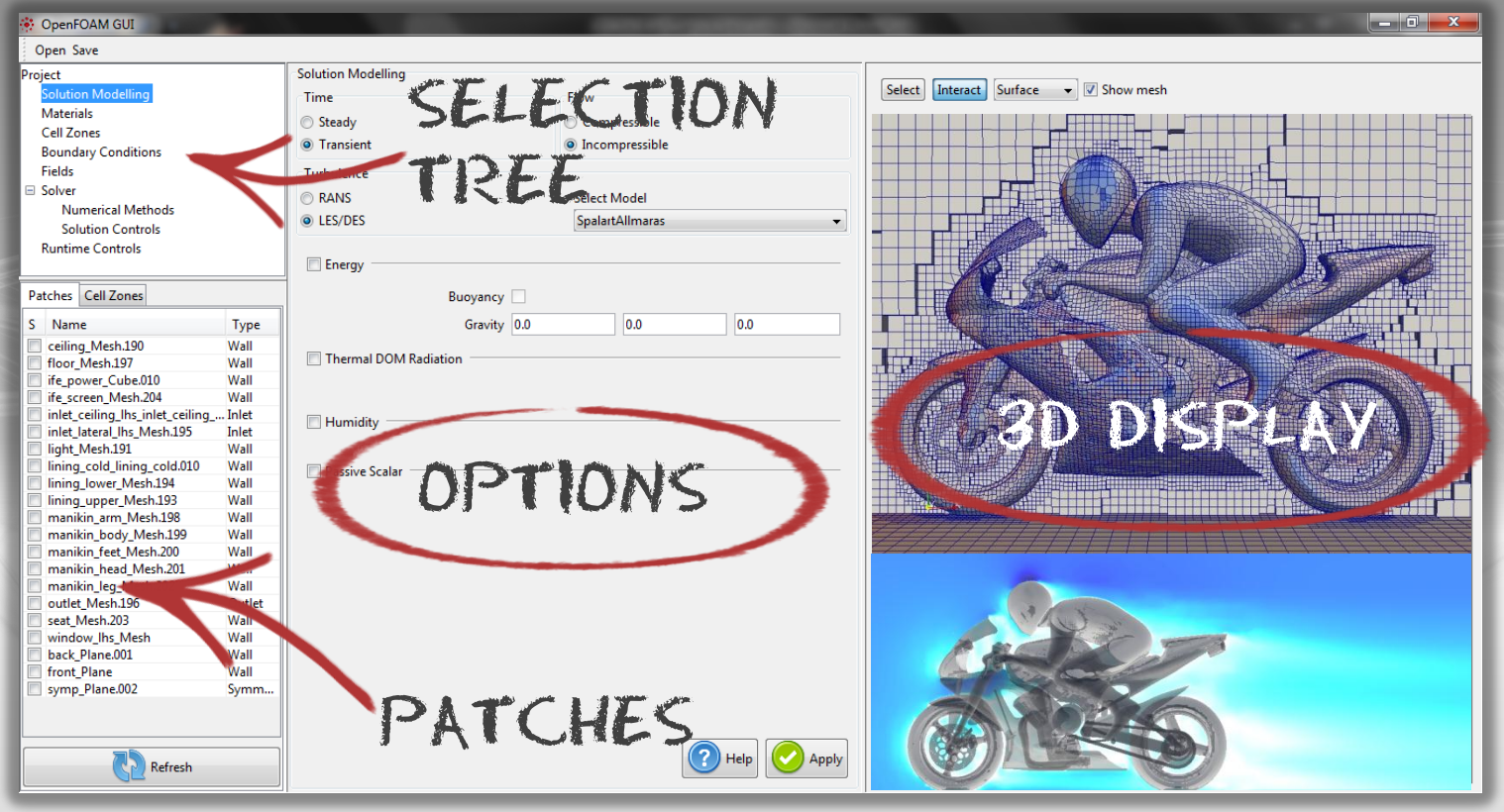
Automatic Parallel Meshing
High-quality, fast, hex-dominant meshes

Open Source CFD Solvers
Aerodynamic, thermal and aeroacoustic

Post-processing and **Monitoring**
Specifically designed for automotive cases

All **ELEMENTS** incorporated into a single, advanced, easy-to-use, **GUI** environment

The GUI

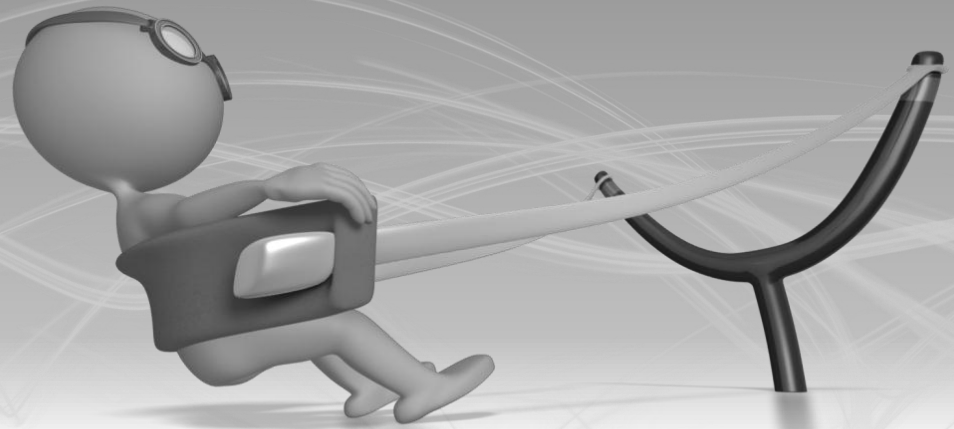


The Launch

JUNE 2012

First release:

- Core GUI and CFD tools

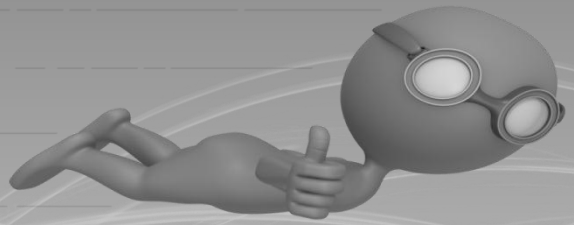


SEPTEMBER 2012

Second release:

- Meshing
- Case setup manager
- Solver execution
- Solution monitoring
- Best practices for all vehicle shapes

The Roadmap



Q1-Q2 2013
Surface morphing
DOE case manager
DAKOTA integration

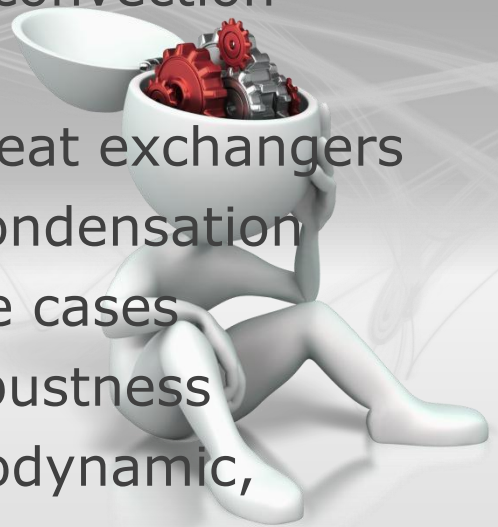
Q3-Q4 2013
Styling tool
Lagrangian solver
Adjoint solver

Q1-Q2 2014
Integrated Post-processing &
CAD preparation

The Solution

The Technical Stuff

- Hex-dominant, fully-conformal, body-fitted, parallel volume meshing with automatic surface wrapping
- RANS, DES and LES solvers
- Thermal solvers for natural, mixed and forced convection
- Thermal (DOM) radiation and solar radiation
- Cell zone support for MRF, porous media and heat exchangers
- Humidity transport with surface evaporation/condensation
- Specialised boundary conditions for automotive cases
- Improved numerical schemes for enhanced robustness
- Dedicated solution monitoring routines for aerodynamic, aero-acoustic and thermal calculations



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