

TOTALSIM

EXPERTS IN
COMPUTATIONAL FLUID DYNAMICS



TS CFD
SERVICES

WWW.TOTALSIMULATION.CO.UK

TOTALSIM

TotalSim is an independent CFD consultancy firm specialising in aerodynamics and fluid flow analysis through the use of open source computational methods.

TotalSim was established in 2007 by the current Managing Director Dr Rob Lewis. TotalSim was a natural replacement for the successful Advantage CFD (established in 1998) which was part of the Honda Formula 1 team until 2006.

TotalSim is based in Brackley, Northamptonshire. We currently employ 20 people in the UK and the company is largely employee owned. We have a sibling office in the USA, sharing our business model and intellectual property.

TotalSim have over 100 years of combined CFD experience designing and developing systems in an extensive range of fields, including Aerospace, Automotive, Marine, Turbomachinery and Energy sectors. [We are experts in the use of CFD.](#)

TotalSim are world leaders in the use of the open source CFD solver OpenFOAM®, working closely with the lead developers to generate new codes and improve existing methods.

TotalSim can also provide support for those wishing to run their own CFD programmes. We offer support packages sharing all of TotalSim's methodologies and codes focused around OpenFOAM®.

TotalSim has developed its own custom built high performance computing system, giving access to over 1400 CPU cores. TotalSim can supply hardware based around our own bespoke low cost recipe, purposely built for CFD.

IN SUMMARY, TOTALSIM CAN PROVIDE COST-EFFECTIVE CFD SOLUTIONS, SYSTEMS, TRAINING AND SUPPORT WITHIN A RIGID TIMEFRAME AND BUDGET.

*OpenFOAM® is a registered trademark of OpenCFD Limited, the producer of the OpenFOAM software. This offering is not approved or endorsed by OpenCFD Limited, the producer of the OpenFOAM software and owner of the OpenFOAM® and OpenCFD® trademarks.



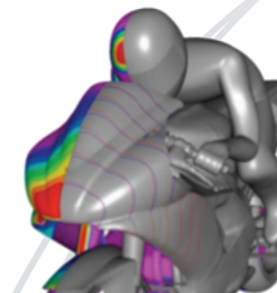
COMPUTATIONAL FLUID DYNAMICS (CFD)

TotalSim's CFD capabilities and experience is amongst the best in the world.

TotalSim can model just about all fluid problems, providing analysis and understanding to complex real world problems.

The number of different applications of CFD is almost endless, but below is a list of a few of the different applications TotalSim can help with.

- **External aerodynamics** - Modelling the flow around vehicles and buildings
- **Internal flows** - Modelling of flows inside vehicles, buildings and even the human body
- **Thermal modelling** - Modelling of temperature distribution and heat rejection
- **Aero-acoustic analysis**
- **Compressible flows**
- **Axial and radial flows** - Modelling systems including fans, compressors and turbines
- **Multiphase flows** - Including marine and oil and gas problems





CFD CONSULTANCY

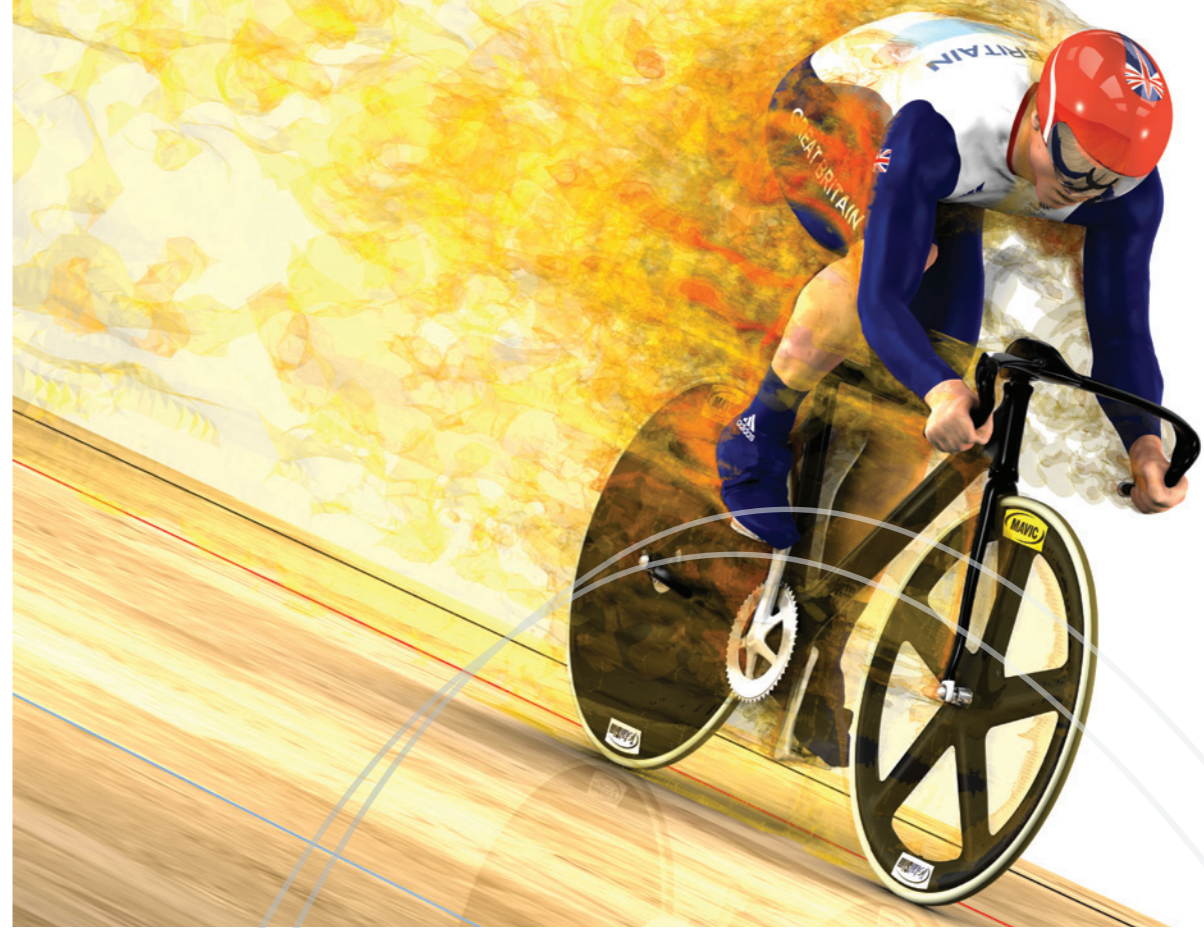
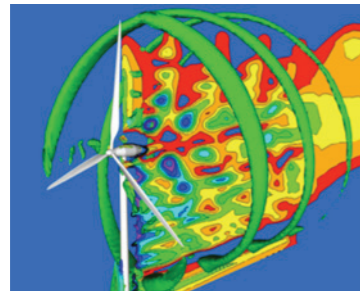
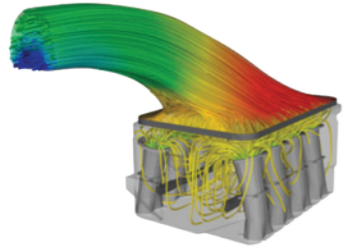
Whatever your CFD needs **TotalSim** can help.

Our consultancy team are experts in CFD with an ISO 9001 certified CFD process using a variety of cutting edge CFD technology that can help you with the analysis of almost all real-world fluid problems. Whether you wish to simulate thermal, hydrodynamic or aerodynamic problems TotalSim have the experience and capabilities to meet your needs.

With 3 CFD design teams in the UK and a worldwide presence, our CFD consultancy business is extremely varied and vastly experienced.

Whatever your CFD simulation needs are, we can help:

- **Product design and development** - TotalSim are experts in applying fluid dynamic analysis to product design across a wide range of applications in order to maximise product potential
- **Design optimisation** - TotalSim are at the forefront of the use of multi-parameter optimisation techniques coupled with CFD morphing technology
- **Flow characterisation and understanding of existing fluid dynamic devices**
- **Performance mapping of products over a range of conditions**
- **Scale-up prototype designs without the need for full-scale testing**



WITH MORE THAN 100 YEARS OF COMBINED CFD EXPERIENCE THE CHANCES ARE WE'VE MODELLED SOMETHING SIMILAR IN THE PAST. TOTALSIM'S EXPERIENCE CAN HELP YOU SAVE TIME AND MONEY FINDING AND SOLVING PROBLEMS.



OPTIMISATION

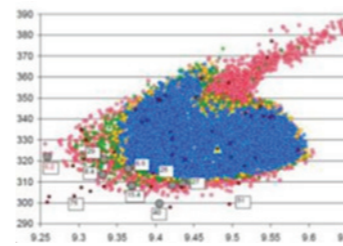
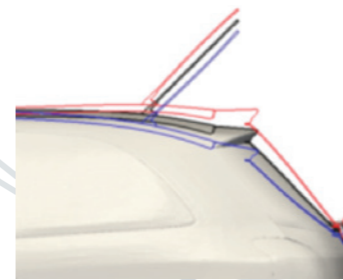
TotalSim are at the forefront of multi-parameter optimisation techniques and CFD morphing technology. We are capable of running hundreds of design iterations within a given design space both quickly and efficiently.

TotalSim's unique optimisation process uses a combination of sophisticated mesh deformation tools and advanced kriging routines. Our process has been developed and refined over many years to create a robust and proven development tool.

Key to our optimisation process is Sculptor® (www.gosculptor.com), a powerful yet flexible mesh deformation tool. Sculptor® can rapidly morph a processed CAD model into an infinite number of variations, reducing the need for complex and time consuming CAD updates and saving significant time and money. TotalSim are resellers of Sculptor®.

Our optimisation process allows multiple geometric parameters to be optimised against multiple performance functions. This may be as simple as maximising lift of an airfoil in a single condition or as complex as maximising efficiency of a wind turbine through a wide range of wind speeds and directions.

TOTALSIM'S OPTIMISATION PROCESS WILL MAXIMISE PRODUCT PERFORMANCE, USING AN EFFICIENT AND COST-EFFECTIVE SOLUTION IN THE QUICKEST TIME POSSIBLE.





CFD SUPPORT

Training, Methodology, Software and Software Development.



Our support contracts can be tailored to your needs. Whether you are a large organisation or single user we have a support contract that can help you.

TotalSim provide a whole suite of tools and a **tested methodology** based around **open source codes** that we use within our own consultancy business.

TOTALSIM PROVIDE MORE THAN JUST CFD SOFTWARE. WE WILL MAKE CFD WORK FOR YOU.

Support contracts start from as little as **£8500 with no annual licencing fees.** This includes our software/codes, support time and a contribution to a central development fund (to help continue the development of our codes).

Your support time can be used for development, training (on or offsite) and auditing.

TotalSim can help develop your own in-house CFD capability, providing training and CFD support, software and hardware. We can even advise on recruitment, and provide extra personnel during those busy times.



CUSTOM CFD HARDWARE

CFD Hardware by CFD users, for CFD users.



TotalSim have developed a custom CFD hardware solution through their consultancy business and are offering that solution to other CFD users.

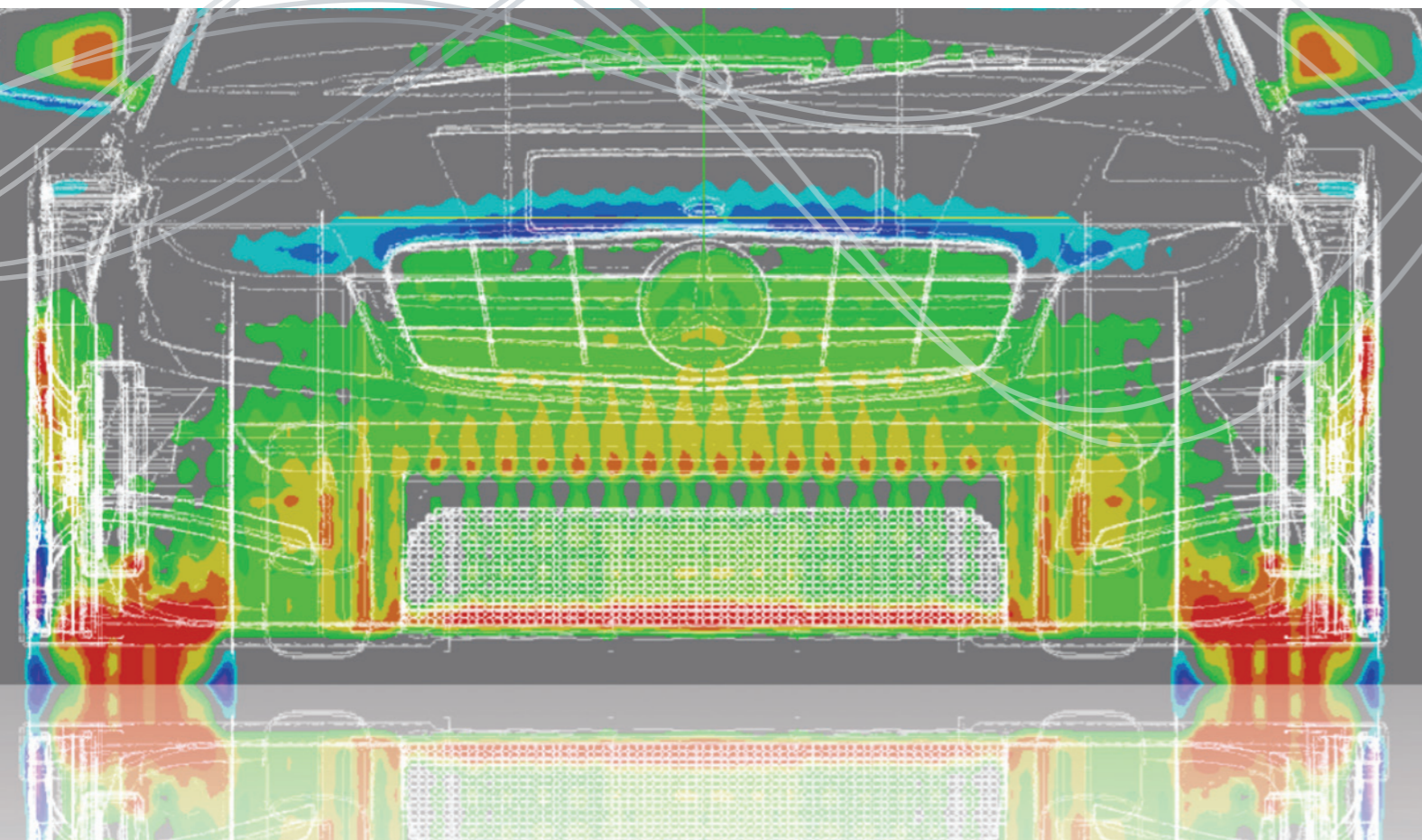
TotalSim are constantly revising their CFD recipe to ensure that the solution is: **COST EFFECTIVE, ENERGY EFFICIENT AND FAST.**

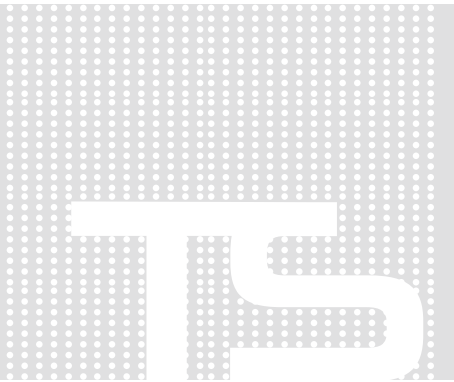
The latest generation is no exception.

The latest recipe is rack mounted, which means it is easily scalable from 6 to 192 nodes or more.

LIKE EVERYTHING AT TOTALSIM OUR HARDWARE PHILOSOPHY IS OPEN.

We will create you a cluster to meet your needs. We will use our knowledge of CFD and CFD hardware to make sure you only pay for what you need and nothing more. Our pricing strategy is unique. We charge for the components with a handling fee of 5% and assembly time at £95/hour. All of our IP that has gone into designing and testing the cluster is completely free.





REFERENCES

TOTALSIM ARE VASTLY EXPERIENCED WHEN IT COMES TO CFD.

We take pride in the huge range of clients we have including high profile companies such as:

- **Aston Martin**
- **UkSport and English Institute of Sport and;**
- **F1 teams**

WHAT OUR CLIENTS SAY ABOUT US

Victoria Pendleton
Olympic and World Champion Track Cyclist

"TotalSim helped us stay at the front of the field."

Willem Toet
Head of Aerodynamics at the Sauber F1 Team

"I was looking for a cost effective solution with fast turnaround times, so I turned to TotalSim. I'm really glad I did!"

Chris Boardman
Head of Research and Development British Cycling

"TotalSim consistently provided innovative ideas"

Sandy Wright
Wolfson Unit

"TotalSim have time and again provided the Wolfson Unit with accurate and instructive computational models of real engineering problems."

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