

Computational Analysis

MRIGlobal

Expertise and experience to rapidly and successfully solve a wide variety of computational analysis problems.

Verified Solutions Fast

MRIGlobal understands the urgency and limited time-frames often associated with computational analysis studies and has the facilities, staff, and protocols in place to successfully ensure rapid turnaround of verified results.

Multi-Physics

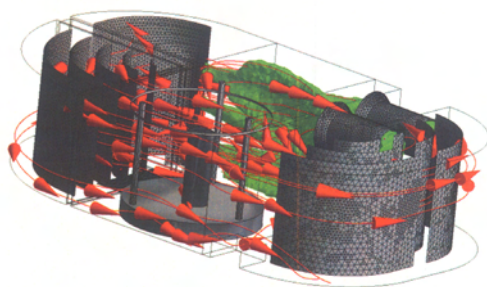
Fluid flow problems often involve complicated geometries and are typically coupled with other physical processes. In these cases, the flows are not amenable to an analytic mathematical solution and must be investigated via computational fluid dynamics (CFD), which is the study of fluid flows by numerical simulation.

- ▲ Turbulence
- ▲ Coupled Heat and Mass Transfer
- ▲ Chemically Reacting Flows
- ▲ Multiphase Flows
- ▲ Particle Dispersion
- ▲ Vapor Dissemination
- ▲ Coupling to Electromagnetic Fields

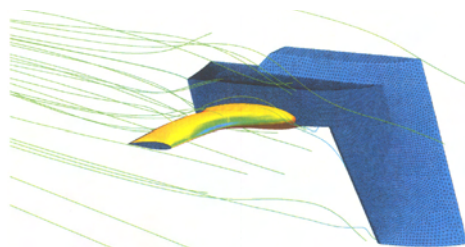
Diverse Applications

Understanding and analyzing complex fluid flows is critical in a broad range of scientific and engineering applications.

- ▲ National defense and homeland security
- ▲ Chemical
- ▲ Oil and gas
- ▲ Hydrogeological and meteorological
- ▲ Biomedical, healthcare, and pharmaceutical
- ▲ Environmental
- ▲ Aerospace
- ▲ Marine
- ▲ Electronics



MRIGlobal utilizes CFD to perform virtual testing and design. The full-scale, time-dependent simulations of the recirculating airflow and dissemination processes within a large chemical exposure chamber are analyzed to ensure all performance specifications are met.



The shape of a marine hydrofoil is crucial for optimal performance. To determine an optimal geometric design, MRIGlobal applied CFD analysis to characterize the relative performance of various designs by studying lift and drag forces, pressure distributions, and water flow profiles.

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About MRIGlobal

MRIGlobal is a not-for-profit organization that performs contract research for clients in business, industry, and government. Founded in 1944, MRIGlobal is one of the nation's leading independent research institutes. We conduct programs in the areas of life sciences, agriculture and food safety, national security and defense, engineering, and energy research.

816.753.7600
425 Volker Boulevard
Kansas City, MO 64110

For more information on MRIGlobal, please contact:

Jack Quint
Program Director

816.753.7600 ext. 1283
jquint@mriglobal.org

Kris Schumacher, Ph.D.
Senior Engineer

816.753.7600 ext. 1042
kschumacher@mriglobal.org

www.mriglobal.org

Reduce Costs and Save Time

Applied to engineering design, CFD reduces the cost and time needed to develop a viable prototype.

- ▲ Virtual tests
- ▲ Rapid prototype assessment
- ▲ Physics-based decisions

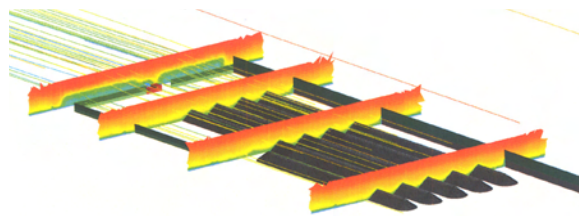
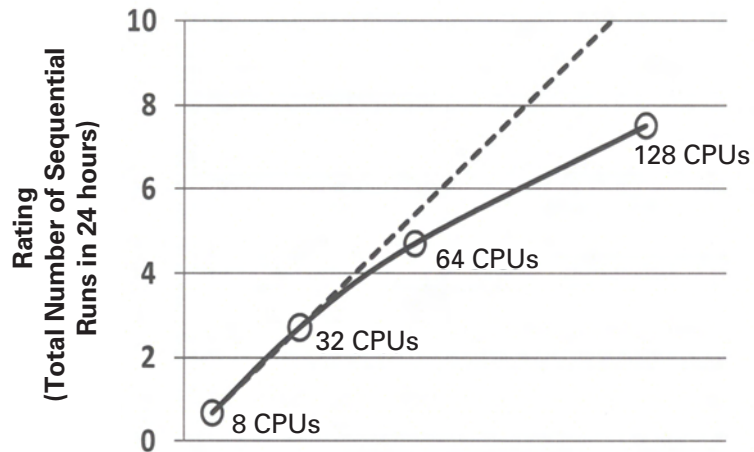
High Performance Computing

MRIGlobal's high-performance computational facilities include a 128-parallel node system, with 256 Gb of RAM, which can handle large, multi-scale and multi-physics problems. MRIGlobal also has an 8-node server and quad-core PCs for smaller CFD simulations.

Expert Staff

MRIGlobal has personnel trained and dedicated to employing experimental, theoretical, and computational fluid dynamics for engineering analysis and fundamental research.

MRIGlobal HPC Benchmark: 26 million elements, 2,000 iterations



MRIGlobal utilizes CFD to analyze atmospheric airflows, erosion potential, and subsequent dispersion. Wind erosion in open storage stockyards can result in material loss and have serious environmental impacts. The aerodynamic sheltering effects of configurations of wind fences, buildings, and greenbelts are analyzed.

State-of-the-Art Software

MRIGlobal utilizes state-of-the-art commercial CFD software (ANSYS Fluent[®]) to analyze complex fluid flows. Fluent[®] is capable of modeling a wide variety of fluid flows important to scientific and engineering studies.