# Dossier: CFD RESEARCH CORPORATION

## SBIR Award Details

**Award Title:** N/A

**Amount:** $999,987.00

**Award Date:** 2024-09-30

**Branch:** NAVY

## AI-Generated Intelligence Summary

**Company Overview:**

CFD Research Corporation (CFDRC) is an engineering simulation and innovation company that provides solutions to complex engineering problems across various industries including aerospace, defense, energy, biomedical, and manufacturing. Their core mission centers around leveraging cutting-edge computational fluid dynamics (CFD), multiphysics modeling, and artificial intelligence/machine learning (AI/ML) to deliver advanced engineering solutions. The company aims to solve challenging problems related to product design, process optimization, and system performance, enabling clients to reduce development time, improve product quality, and enhance operational efficiency. CFDRC's unique value proposition lies in its ability to integrate advanced simulation technologies with innovative AI/ML techniques to offer highly accurate, predictive, and optimized solutions tailored to specific customer needs, often focusing on highly specialized or difficult-to-model phenomena.

**Technology Focus:**

* CFD and Multiphysics Simulation: Specializes in simulating fluid dynamics, heat transfer, chemical reactions, electromagnetics, and structural mechanics. Provides customized software tools and engineering services for performance prediction, optimization, and risk assessment.
* AI/ML-Powered Engineering: Develops and integrates AI/ML algorithms for predictive modeling, surrogate modeling, data analytics, and automated design optimization. Focuses on creating intelligent tools that accelerate simulations and improve design processes.
* Hardware Prototyping and Testing: Combines simulation-based design with hardware prototyping and testing capabilities. This includes developing and testing innovative solutions for propulsion systems, energy devices, and biomedical applications.

**Recent Developments & Traction:**

* October 2023:\*\* Secured a $1.7 million contract from the U.S. Army Combat Capabilities Development Command (DEVCOM) Aviation & Missile Center (AvMC) to develop a physics-based surrogate model for air-augmented rocket ramjet (AARRJ) engines.
* June 2023:\*\* Awarded a contract by the U.S. Army to develop Artificial Intelligence/Machine Learning (AI/ML) digital twins for the Next Generation Combat Vehicle (NGCV).
* November 2022:\*\* Partnered with Sentient Science to integrate DigitalClone® software with CFDRC's simulation tools for improved life prediction and maintenance optimization for complex systems.
* April 2022:\*\* Awarded a Direct-to-Phase II Small Business Innovation Research (SBIR) contract from the Defense Threat Reduction Agency (DTRA) to develop a novel multi-physics simulation and AI-enabled platform for accelerated material discovery and threat reduction.

**Leadership & Team:**

* Sameer Singhal, President:\*\* Possesses extensive experience in engineering simulation and technology commercialization.
* Dr. Ashok K. Singhal, Founder and CEO:\*\* A renowned expert in CFD and multiphysics modeling with over 40 years of experience in the field.

**Competitive Landscape:**

* Ansys:\*\* A leading provider of general-purpose simulation software. CFDRC differentiates itself through its specialization in advanced AI/ML-integrated solutions and its focus on specific niche applications within aerospace and defense.
* Siemens (STAR-CCM+):\*\* Another major player in CFD software. CFDRC competes by offering more customized solutions and targeted expertise in combining simulation with AI/ML for complex engineering problems.

**Sources:**

* [https://www.cfdrc.com/](https://www.cfdrc.com/)
* [https://www.cfdrc.com/cfdrc-awarded-1-7-million-contract-from-us-army-to-develop-physics-based-surrogate-model-for-air-augmented-rocket-ramjet-engines/](https://www.cfdrc.com/cfdrc-awarded-1-7-million-contract-from-us-army-to-develop-physics-based-surrogate-model-for-air-augmented-rocket-ramjet-engines/)
* [https://www.cfdrc.com/cfdrc-awarded-contract-by-us-army-to-develop-ai-ml-digital-twins-for-the-next-generation-combat-vehicle-ngcv/](https://www.cfdrc.com/cfdrc-awarded-contract-by-us-army-to-develop-ai-ml-digital-twins-for-the-next-generation-combat-vehicle-ngcv/)
* [https://www.sentientscience.com/press-release/sentient-science-and-cfdrc-partner-to-improve-digitalclone-with-advanced-simulation](https://www.sentientscience.com/press-release/sentient-science-and-cfdrc-partner-to-improve-digitalclone-with-advanced-simulation)