# Dossier: COMBUSTION RESEARCH & FLOW TECHNOLOGY INC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $166,724.00

**Award Date:** 2024-09-24

**Branch:** DTRA

## AI-Generated Intelligence Summary

**Company Overview:**

Combustion Research and Flow Technology, Inc. (CRAFT Tech) specializes in providing advanced computational fluid dynamics (CFD) and engineering solutions to improve the performance, safety, and reliability of combustion, propulsion, and energy systems. Their core mission is to enhance understanding and optimization of complex flow physics to enable cleaner, more efficient, and robust designs for aerospace, defense, and energy applications. CRAFT Tech aims to solve problems related to combustion instability, emissions reduction, engine performance enhancement, and high-speed aerodynamics through advanced simulation and modeling capabilities. Their unique value proposition lies in their in-depth expertise in physics-based modeling coupled with high-performance computing, enabling rapid prototyping and virtual testing, reducing reliance on costly and time-consuming physical experiments.

**Technology Focus:**

* Advanced CFD Software:\*\* Develops and offers CRUNCH CFD, a high-fidelity, massively parallel CFD solver used for simulations of compressible and incompressible flows, combustion, and multi-physics phenomena. CRUNCH CFD is specifically designed for complex geometries and challenging flow conditions.
* Consulting Services:\*\* Provides engineering consulting services utilizing their proprietary software and expertise to optimize combustion systems, analyze propulsion performance, and address fluid dynamics challenges in aerospace and energy applications. This includes custom model development and solver customization.

**Recent Developments & Traction:**

* SBIR/STTR Awards:\*\* Regularly receives SBIR/STTR awards from agencies like NASA, Air Force, and DOE to develop advanced modeling capabilities in areas such as hypersonic combustion, detonation physics, and alternative fuels. Recent awards focus on enhanced turbulence models for LES and DES simulations.
* CRUNCH CFD Enhancement:\*\* Continuous updates and enhancements to CRUNCH CFD software, including improved parallel scalability, advanced turbulence models, and coupling with other simulation tools. Releases of new versions with documented performance improvements and expanded features.
* Partnerships with Research Institutions:\*\* Collaborations with leading universities and research labs on projects related to combustion, propulsion, and fluid dynamics. This includes joint publications and development of advanced modeling techniques.

**Leadership & Team:**

* Dr. Krishnan Mahesh (CEO):\*\* Extensive experience in computational fluid dynamics, turbulence modeling, and combustion. PhD in Mechanical Engineering. Recognized expert in CFD with numerous publications.
* Information on other specific leadership roles were not available.

**Competitive Landscape:**

* Ansys:\*\* Ansys offers a broad suite of engineering simulation software, including CFD tools. CRAFT Tech differentiates itself through its specialized focus on combustion and propulsion applications, offering a more tailored and potentially higher-fidelity solution for these niche areas.
* Siemens (Star-CCM+):\*\* Siemens' Star-CCM+ is another major CFD player. CRAFT Tech's differentiator is their physics based models, and the lower cost licensing fees, potentially making them more attractive for specific projects or smaller organizations.

**Sources:**

1. [https://www.craft-tech.com/](https://www.craft-tech.com/)

2. [https://www.crunchcfd.com/](https://www.crunchcfd.com/)

3. [https://www.sbir.gov/](https://www.sbir.gov/) (Used to search for SBIR/STTR awards to CRAFT Tech)

4. [https://scholar.google.com/](https://scholar.google.com/) (Used to search for publications related to CRUNCH CFD)