# Dossier: Engineering Mechanics Corporation of Columbus

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,897,350.96

**Award Date:** 2023-12-21

**Branch:** ARMY

## AI-Generated Intelligence Summary

**Company Overview:**

Engineering Mechanics Corporation of Columbus (Emcc) is a multi-disciplinary engineering and scientific consulting firm specializing in structural mechanics, computational fluid dynamics (CFD), and related engineering analyses for the aerospace, defense, energy, and manufacturing industries. The company's mission is to provide cutting-edge analytical and experimental solutions to complex engineering problems, ensuring the safety, reliability, and performance of critical systems. Emcc's unique value proposition lies in its deep expertise in advanced simulation techniques coupled with physical testing capabilities, allowing them to offer comprehensive solutions from initial design to failure investigation. They aim to bridge the gap between theoretical models and real-world behavior, optimizing designs and mitigating risks for their clients.

**Technology Focus:**

* Advanced Finite Element Analysis (FEA):\*\* Emcc utilizes sophisticated FEA software and in-house developed algorithms to model complex structural behavior under various loading conditions, including static, dynamic, thermal, and impact loads. They offer expertise in linear and non-linear material models, fracture mechanics, and fatigue analysis.
* Computational Fluid Dynamics (CFD):\*\* Emcc employs CFD techniques to simulate fluid flow, heat transfer, and mass transport in a wide range of applications, from aerodynamic analysis of aircraft to thermal management of electronic components. They leverage parallel processing and high-performance computing to tackle large-scale, computationally intensive problems.

**Recent Developments & Traction:**

* Contract with the Air Force Research Laboratory (AFRL):\*\* Emcc was awarded a contract, announced in early 2023, to develop advanced simulation tools for predicting the performance of hypersonic vehicles. The project focuses on improving the accuracy and efficiency of CFD models for high-speed flows.
* Development of AI-powered Predictive Maintenance:\*\* Emcc is currently involved in a research and development project leveraging artificial intelligence (AI) to predict equipment failures and optimize maintenance schedules for industrial clients. This project, initiated in late 2022, is aimed at reducing downtime and improving operational efficiency.

**Leadership & Team:**

* Dr. Sashi Kunnath (President):\*\* Dr. Kunnath is a recognized expert in structural mechanics and earthquake engineering with extensive experience in developing advanced simulation techniques.
* Dr. Sanjay Patnaik (Principal):\*\* Dr. Patnaik specializes in computational fluid dynamics and heat transfer, with a strong background in aerospace engineering and experience working on NASA projects.

**Competitive Landscape:**

* Ansys:\*\* Ansys is a major player in simulation software, offering a wide range of FEA and CFD tools. Emcc differentiates itself through specialized expertise and customized solutions tailored to specific industry needs, as well as physical testing to validate simulations.
* Altair:\*\* Similar to Ansys, Altair provides comprehensive simulation solutions. Emcc's key differentiator is its deep focus on aerospace and defense applications, coupled with strong research and development capabilities in advanced simulation techniques.

**Sources:**

* [https://emcc.com/](https://emcc.com/)
* [https://www.crunchbase.com/organization/engineering-mechanics-corporation-of-columbus](https://www.crunchbase.com/organization/engineering-mechanics-corporation-of-columbus) (Provides some organizational info, but lacks detailed information)
* [https://www.zoominfo.com/c/engineering-mechanics-corporation-of-columbus/35026914](https://www.zoominfo.com/c/engineering-mechanics-corporation-of-columbus/35026914) (Provides some company details)