DeepSoft, Inc. Engineering • Programming • Training
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Capabilities Statement

DeepSoft, Inc. is a consulting engineering firm specializing in the technical areas of specialization listed below. The company was originally formed in 1986 as TKF Systems. In 2000 a corporation was formed and the name was changed to DeepSoft, Inc. It is recognized as a small business by the SBA and is listed on PRO-Net, the cage code is 3BQK2.

Mechanical Engineering

Finite Element Analysis (FEA)
Stress, Thermal, & Dynamic Analysis
3D Solid & Surface Modeling
2D & 3D CAD
Mechanical Design

DeepSoft, Inc. can provide stress, thermal, and dynamic analysis of mechanical components via Finite Element Analysis (FEA), custom computer programming, or manual calculations. The principal's past experience has included equipment ranging from manufacturing machinery, hoists, missile radomes, and submarine systems to pressure vessels for oceanographic applications. Workstation based CAD/CAE/FEA software, including parametric 3D solid modeling, is used for all engineering design, development, and analysis. The combination of 3D solid modelers and FEA software is extremely powerful for the development of new or improved products or equipment. Mechanical design is available from initial concept through detail design with 3D solid modelers or CAD and FEA.

Utilizing 3D solid & surface modelers as the primary design tool allows creating the 3D-product geometry once and when complete, using it for all subsequent downstream activities. Typically these can include all of the following: 2D & 3D FEA, creation of 2D detailed drawings, 3D assembly exploded drawings, 3D CNC manufacturing, and graphics illustrations for training materials, sales & marketing materials, and product documentation. The principal has been using AutoCAD since 1984, Algor FEA since 1988, Inventor since 2000, Nastran since 2004, and SolidWorks since 2004.

DeepSoft, Inc. recently completed a modal frequency and shock impact analysis of a portable ultrasonic cleaner developed by Battelle for the US Army. This project was undertaken and successfully completed with SolidWorks and the Algor FEA software.

DeepSoft, Inc. recently completed twenty complex stress and thermal FEA studies for Duratek, Inc. on a DOE contract for their nuclear waste vitrification melters. These engineering analyses and reports of 25 to 80 pages each were all completed accurately, on time, and within budget.

Software Engineering

C & C++ Programming
Engineering, Scientific, Medical, & Security Applications
Microprocessor & Microcontroller Based Intelligent Instruments
Real-time Embedded Applications
Windows MFC GUI & Unix Applications
Object Oriented Analysis & Design

PalmOS Applications
Registered Autodesk Developer for AutoCAD & Inventor Applications

DeepSoft, Inc. has developed custom Architectural and Civil Engineering AutoCAD tools for Toll Brothers and Eastern States Engineering. This application was developed with Microsoft's Visual C++ and uses the Autodesk ObjectARX C++ API as well as Microsoft's MFC. Enhancement work on this application continues today.

DeepSoft, Inc. can provide C & C++ analysis, design, and programming for engineering, scientific, medical, and security applications for Windows MFC, UNIX, and ROM based applications. Both Object Oriented and Procedural methods can be supported, as appropriate, for your application and platform. The principal has been programming in C since 1984, and C++ since 1991.

Designed and coded the real-time embedded memory manager in C & C++ for the US Navy's Unix/Linux based Cooperative Engagement Processor for Lakota Technical Solutions and got an experimental FCC radio license for them. This memory manager uses DSR's Middleware, emulates many VxWorks functions, and is based on a 3D, doubly linked, linked list.

Ocean Engineering

Diving Equipment
Deep Submergence Systems
Oceanographic Instrumentation

Ocean Engineering, an interdisciplinary field, is normally studied after completing undergraduate work in a more traditional field of engineering. Ocean Engineering, as practiced at DeepSoft, Inc., means a specialized marine training and experience layer built on top of a traditional mechanical, electrical, and software engineering foundation.

The Ocean Engineering capabilities of DeepSoft, Inc. include designing diving equipment, deep submergence systems, and oceanographic instrumentation. Specifically the principal has worked on the design, development, and fabrication of a diver propulsion vehicle, a diver's decompression computer, an experimental analysis of the effectiveness of CO_2 scrubbers, and the design and stress analysis of pressure resistant and pressure compensated housings for depths of 10,000 feet.

The principal designed a decompression computer for divers. The work included: conceptual design, developing the mathematical model for the software, writing the real-time interrupt driven software in C, custom battery powered CMOS SBC design based on the NSC800 and 80C31, design of a multilayer printed circuit board, mechanical design and FEA stress analysis of the pressure resistant housing. This hand-held intelligent instrument includes power-on self-test, measures current depth, maximum depth, bottom time, surface interval time, tank air pressure, air time remaining at current consumption rate, temperature, battery condition, and computes diluent nitrogen partial pressures in a twelve tissue mathematical model of the human body as a function of depth and time at depth. This decompression model is used to compute the maximum safe ascent ceiling for the diver based on his current nitrogen partial pressure profile. The computer also checks for: low battery, low air, ascend/descend too fast, diver above safe ceiling, and device maximum depth limit exceeded.

Technical Software Training

Introductory, Intermediate, and Advanced AutoCAD
Solid Modeling with Autodesk Inventor
Finite Element Analysis with Algor

Introductory, Intermediate, and Advanced C Programming
Introductory, Intermediate, and Advanced C++ Programming
Object Oriented Analysis & Design
Microsoft Windows MFC GUI Programming

In addition to providing professional engineering and software development services, DeepSoft, Inc. can provide technical software training using the same tools that are used for professional development. These are all instructor led training courses with about 50% of the time spent on hands on activities by participants. All participants receive a 40 to 200 page notebook. The programming courses include a solution set which can be up to 100 pages itself.

DeepSoft, Inc. and its direct predecessor, TKF Systems, had a series of continuous contracts spanning eight years to teach all of the onsite C & C++ programming courses at NASA's Goddard Space Flight Center in Greenbelt, MD. In a ten-day 70-hour C programming course taught for Federal Express in Memphis, TN, thirteen out of fifteen students rated the instructor and course material as excellent. The principal received similar evaluations from Federal Express for a 5 day 35-hour C++ training course. These courses can be offered at the client's site, in a rental classroom, or for classes of four or fewer participants in the DeepSoft, Inc. office. See the website for a complete course catalog and detailed description of each course.

Technical Publications & Marketing Materials

Microsoft Word & Excel; Corel Ventura Publisher, Draw, & Paint; Adobe PhotoShop & Acrobat Distiller are all available for the creation of technical publications and ancillary marketing materials. All of these tools can drive the HP DesignJet 800 Postscript printer which supports paper 42" wide in 150' rolls by 2400 dpi at 16.7 million colors. The DesignJet printer supports CAD drawings, solid model renderings, FEA models and results, full size topographic map production, large image photographic output, and large format graphic arts posters, which can contain any or all of these elements.

Facilities

The office is professionally furnished and equipped with four engineering workstations. All systems are running Windows XP Pro, 2000 Pro, or NT 4, use 32 or 64 bit processors, include 64 Mb's to 4 GB RAM each, use 19" to 21" CRT monitors, include fast SCSI hard drives and controllers, and are linked with 100 MBPS fast Ethernet. Two film scanners, a flatbed scanner, two printers, and an HP 800 DesignJet printer/plotter support graphical i/o. High speed fiber optic internet access is available on all workstations via a network cable router.

Ted K. Fryberger, PE
President
BSME, MSME & OE

Member:
American Society of Mechanical Engineers
NAFEMS - The International Association for the Engineering Analysis Community
Authorized Autodesk Application Developer