



## ROBERT A. DASILVA

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### EDUCATION:

#### **University of Massachusetts Lowell**

B.S. Mechanical Engineering – 1995

M.S. Mechanical Engineering – 2001

- Concentration - Finite Element Analysis, Vibrations, and Composite Materials
- Master's Thesis – Modeling and Characterization of Linear Braided Composite Structures

### KEYWORDS:

Stress Engineer, SolidWorks CAD, Mechanical Engineer, Finite Element Analysis (FEA) of Composite Materials and Metallic Structures (FDT, TMF, Creep), SolidWorks Simulation, Machine Design, Vehicle Design, Turbine Engine Design, Engineering Drawings, GD&T, Modal Analysis, Material Science, Classic Laminate Theory, Carbon Fiber, Vibrations, Tooling Design, Injection Molding, Test Design, Composites Manufacturing, Vehicle Dynamics, Electric Car Design, Hard Drive Manufacturing, Missile Launch Systems, Navy Hatches, Mechanisms, Proposals and Report Writing, Government and SBIR Contracts, Prime Contracts, Subcontracting, Procurement, Accounting, Legal and Non-Disclosures, Project Management, Controller, CEO, CFO, Administrative, and Patents.

### PROJECTS:

**Aerospace:** GE Aircraft Engines (Compressor Blades, Vanes, and Rings), Pratt & Whitney Aircraft Engines (Blades, Vanes, Seals, and Cooling), A10 Fighter Composite Wing, H60 Helicopter Composite Tail Cone, PAC-3 Missile Launch Canister, EAPS Missile Launch Canister, 25Ft Missile Braider, C17 Airdrop Platforms, C17 / F15 Aircraft Runway Matting, Fighter Jet Towed Decoy, Army Mortar Base, 2.75 Rocket Canisters

**Automotive:** Electric Car Chassis, Electric Car Battery Case, Expeditionary Roadway Matting, 40-Ft Vertical Car Crash Tower, Formula Ford Race Car, Solar Car, Baja Car, Composite Motorcycle, Ford Side Impact Beam

**Computer:** WD Hard Drive Production (Testing, Quality, Assembly), Hard Drive Totes, Ghost Drive

**Marine:** Ohio Class Submarine Communications Buoy, Aircraft Carrier Jet Blast Deflector, Navy Destroyer Hatch and Mechanism, Virginia Class Submarine Sensor Mast (UMM), LCAC Hovercraft Ramp, Boat and Truck Transmissions, Carrier Deck Edge Safety Nets

**Composite Material Manufacturing:** Pultrusion Machines, Light RTM Molding, Braiding Machines, Injection Molds, Ceramic (SiC SiC) Molds, Composite Fastener, Composite Testing, Braided Rope

**Military:** Composite Bridge Repair, Bomb Detector, Jaws of Life, Ammunition Canisters

### WORK

#### **XCraft, Inc**

JUL 2007– PRESENT

### EXPERIENCE:

#### **President / Chief Engineer / Principal Investigator**

Owned and operated XCraft, Inc, a Boston-based mechanical engineering defense prime emphasizing production-level design and build of DoD weapon systems. Performed as chief engineer, contract procurement specialist, and principal investigator. XCraft specializes in the application of materials comprised of high-performance fiber reinforced composite materials. These applications include vehicle structures, computer manufacturing automation, test devices, DoD weapon systems, and aerospace, marine, and ground vehicle transportation systems. Some of these projects include:

U.S. Navy / Clear Carbon: 2024/25, Principal CAD Design and FEA for Ohio Class Submarine Buoy

U.S. Navy: 2024, FEA Stress Analysis of Navy Aircraft Carrier Jet Blast Deflector

U.S. Army: 2022/23, Prime Contract to Design, Analyze, Test, & Build Composite Mortar Base

James Gallagher, INC: 2022, Stress Analysis of 25ft Diameter Composite Braiding Machine

U.S. Air Force: 2019 - 2021, Prime Contract to Design and Produce Composite Expeditionary Airfield Runway for C-17 and F-15E

Custom Technologies: 2017 – 2019, Analysis and Design of Army Composite Bridge Repair  
 U.S. Marine Corps: 2011 - 2017, Prime Contract to Design and Produce Composite Expeditionary Roll-out Roadways for Heavy Military Vehicles  
 Nucleus Scientific: 20016 - 2017, FEA and Material Selection for Composite Electric Car  
 Teradyne: 2012 – 2013, Design and Manufacture of Hard Drive Test Machine Composite Spar  
 Teradyne: 2008 - 2011, Principal Designer of Hard Drive Production Systems for Western Digital  
 Teradyne: 2007-2010, Design and Manufacture of Composite Surrogate “Ghost Drive” Test Device  
 U.S. Army: 2010 - 2011, Prime Contract for Design and Testing of EAPS Missile Launch System  
 Triton Systems: 2008-2009, Design and Manufacture of Portable Bomb Detection  
 Triton Systems: 2008-2011, Design of Composite Ammunition Shipping Containers  
 Triton Systems: 2010 – 2011, Tooling Design and Mfg. of SiC-SiC Turbine Engine Components  
 Triton Systems: 2008 – 2013, Design, Analysis, and Test Large Composite Military Airdrop Platforms  
 Azure Dynamics: 2007 – 2009, FEA of Super Capacitor and Electric Car Components  
 KaZaK Composites: 2007-2008, Design and Analysis of Army Vehicle Rescue Spreaders

- Performed ANSYS and SolidWorks Simulation finite element analysis (FEA) of metallic and composites including CLT and Tsai-Wu failure
- Constructed complex CAD models of structures and machines using SolidWorks and SolidWorks Motion
- Performed as owner, manager, principal investigator, engineer, CFO, and controller for small company
- Acquired, managed, and supported multi-million dollar programs
- Acted as principal engineer for \$1.5B Teradyne Neptune hard drive test system for WD
- Managed several employees and programs including: developing project scope, performing cost analysis, creating schedules of performance, generating estimates to complete, conducting trade studies, procuring materials, appropriating personnel resources, & negotiating contracts
- Designed, analyzed, tested, and manufactured both metallic and polymer-based fiber reinforced composite structures for the DoD and private companies.
- Developed, built, and analyzed sub-element and full-scale test matrices
- Designed injection molding and composite tooling
- Designed, simulated, and assembled mechanisms
- Created engineering drawings compliant to GD&T ASME Y14.5-2018
- Wrote innumerable proposals, white papers, and technical progress reports
- Headed resource planning efforts
- Ran commercialization and marketing activities including website design
- Traveled to speak with customers and presented at trade conferences
- Operated milling machines and performed hand lay-up in mfg. environments

***KaZaK Composites, Inc - Woburn, MA***

JAN 2003 – JUL2007

***Engineering Manager / Stress Engineer / Mechanical Engineer/ Principal Investigator***

- Performed ANSYS and SolidWorks Simulation finite element analysis of metallic and composite structures and components, including CLT and Tsai-Wu failure
- Acquired, managed, and supported multi-million dollar DoD SBIR programs
- Managed programs and personnel including: developing project scope, performing cost analysis, creating schedules of performance, generating estimates to complete, conducting trade studies, procuring materials, appropriating personnel resources, and holding subordinate performance reviews
- Designed, analyzed, tested, and fabricated polymer-based fiber reinforced composite structures for the DoD using finite element analysis and classic laminate theory
- Performed ANSYS finite element analysis of composites including Tsai-Wu failure
- Performed analysis of bolted joints
- Performed wave slap and hydrodynamic analysis of nuclear submarine mast
- Developed sub-element and full-scale test matrices
- Designed pultrusion mfg tooling
- Designed, simulated, and assembled mechanisms
- Created engineering drawings
- Designed airfoil ballistics protection
- Wrote monthly technical progress reports

- Down-selected and wrote proposals in response to D.O.D. solicitations
- Developed agendas and presentations for interchange meetings with commercial and military originations including the US Navy Submarine Program Executive Office.
- Headed resource planning effort
- Initiated commercialization activities
- Traveled to speak with customers and presented at trade conferences

*Selection of Composite Projects:* PAC-3 pultruded missile launch canister, Virginia Class submarine antenna mast, Navy DDG hatch and mechanism, Army ammunition containers, A10 composite rear stabilizer L/E, Air Force molded composite antenna tower fastener, Navy ship deck tiles, and inline pultruded camouflage panels.

***GE Aircraft Engines – Lynn, MA***

JUN 2002 – JAN 2003

*Stress Engineer* – Compressor Air Foils COE

- Performed vibratory, steady state, and non-linear structural analysis of rotor blades, stators, discs, and actuating ring components for commercial and military aircraft turbine engines using 3-D finite element methods (ANSYS)
- Predicted aeroelastic instability and stall margins for engine components
- Generated vibratory displacement limits for instrumented engine tests

***Pratt & Whitney – East Hartford, CT***

*Stress Engineer* – Turbine Module Center

JUL 2001 – JUN 2002

- Performed steady state and non-linear structural and thermal analysis of vanes, stators, outer air seal components, and ring support assemblies for commercial and military aircraft, and land-based turbine engines using 3-D finite element methods (ANSYS, Patran)
- Evaluated new turbine engine component life based on low cyclic fatigue, thermal mechanical fatigue, creep, and vibratory response, to meet P&W standard work requirements
- Predicted repaired part damage tolerance and overhaul life
- Validated and controlled structural aspects of part repair and overhaul processes
- Used analytical and statistical methods to determine cumulative damage effects on engine part overhaul cycle.

***RAD Science Design and Analysis***

SEP 2000 – JUL 2001

*Self Employed Engineering Consultant*

- Analyzed materials through finite element methods
- Designed experiments and fixturing for materials testing
- Maintained a personal business (i.e., accounting, marketing, web design, etc.)

***Velvet Drive Transmissions (Borg Warner)***

DEC 1995 – SEP 1997

*Head of Prototype Production* – Engineering

- Designed, developed, and produced prototype pleasure craft and industrial truck transmissions in-house. Designed CNC casings, cooling system circuits, gear profiles, train layouts, and planet carriers. Selected all components, including bearings, seals, breathers, gaskets, pins, and fasteners.
- Oversaw hobbing, broaching, and heat treat operations conducted in production plant.
- Worked with vendors and customers throughout the design process

*Product Engineer* - Engineering

- Designed, engineered, and selected final components for production pleasure craft and boom truck transmissions.
- Created associated production drawings including train layout, gear profile and casting details.
- Worked and interacted with assembly, tooling, sales, accounting, engineering etc.

*Design Engineer* – Research and Development

- Responsible for developing 1000 horsepower computer controlled endurance test stand for 300 hour simulation of propeller thrust loading on marine transmissions. Responsibilities included design and analysis of all systems and components, subsequent engineering drawings, data acquisition system design, and transducer, sentinel, and wiring installation.
- Headed the evaluation of production transmissions using endurance test stand.

- Diagnosed field transmission mechanical and noise problems.
- Performed experimental modal survey and analysis of gear noise and transmission vibration.

## **ACADEMIC WORK**

### ***University of Massachusetts Lowell***

SEP 1997 – AUG 2000

#### ***Research Assistant – Advanced Composite Materials and Textile Laboratory***

- Tested and analyzed composite materials. Designed required fixturing, used Instron, instrumentation, computer DAQ, and analyzed results.
- Revamped 64-carrier composite braiding machine, including the design of 30 ft. gantry mechanism for mandrel translation.
- Machined components and fixtures using milling machines, lathes, and CNC mill tables.
- Presented at the following professional conferences: ASME, SAMPE, NTC, MIT, Virginia Tech
- Published papers in journals and conference proceedings

#### ***Teaching Assistant – Mechanical Engineering***

- Responsible for supplementary and substitute teaching of courses including Machine Design I and II, Design of Machine Elements, and ME Instrumentation Laboratory II.
- Set-up and executed student laboratory experiments including fluid flow, vibrations, strength of materials, heat transfer, and the manufacture of cams and mechanisms.
- Worked with instrumentation including LVDTs, accelerometers, strain gages, extensometers, digital signal analyzers, oscilloscopes, computer DAQ boards, signal conditioning
- Held extended office hours and created additional tutorials to assist students.
- Graded homework, lab reports, and tests.

#### ***Tutor – Studies Skills Advisor – Centers for Learning***

- Tutored students in Physics, Math, Writing
- Advised students in course selection and study skills (i.e., time management, organization)

## **ADVANCED**

### **COURSEWORK:**

- Vibrations / Structural Dynamics
- Analytical Modal Analysis I
- Experimental Modal Analysis II
- Advanced Calculus for Apps.
- Finite Element Analysis (FEA)
- Composites I
- Structural Composites II
- Solid Mechanics
- FEA in Thermofluids
- Vehicle Dynamics
- PTC Pro/Engineer

## **ACADEMIC PROJECTS:**

- Design, fabrication, & testing of solar car suspension, chassis, and steering - SunRayce '95
- First place in design for amphibious SAE Mini-Baja suspension system - Baja '95
- Complete design of a 40 ft vertical automotive impact tester with DAQ
- Analysis, design, and fabrication of cold side slider crank/piston and flywheel assembly for Sterling engine
- 2-D modal analysis of Solar Thermal Central Receiver

## **COMPUTER SKILLS:**

- *Finite Element Analysis Tools:* SolidWorks Simulation, ANSYS, Abaqus, Nastran, Patran, Femap, Hypermesh, LS Dyna, NX, SimFlow
- *CAD Tools:* SolidWorks, CATIA, Pro/Engineer, Creo, Helius CompositePro, AutoCAD, CADkey, MasterCAM, Working Model, UniGraphics, UG
- *Languages:* Labview, Matlab, MathCAD, Fortran, HTML
- *Operating systems:* Windows, Mac, Linux

- *Media and Misc: Quickbooks, Microsoft Office, Excel, Microsoft Word, Microsoft Project, PowerPoint, Adobe Photoshop, Adobe Premier, Adobe Illustrator, WordPress*

### **SHOP SKILLS:**

- Milling Machine, lathe, CNC router, sheet metal brake, 3-D printers (SLS / SLA / FDM), composite hand lay-up, composite braiding, filament winding, RTM, autoclave molding, pultrusion machines, molding hot-press, MIG / stick welding, table and chop saws, gear hobbers, castings, plasma cutting, water jet, EDM, centrifuge directional solidifying, splash molding, injection molding, various woodworking machinery and hand tools, and automotive and motorcycle specialty tools. Father was a furniture builder and I grew-up in a wood shop. Later worked in a machine shop during college.

### **Journal Articles and Conference Papers:**

R.A. DaSilva, J. Chen, Compaction Effects in Composite Preforms, Proceedings of the International Mechanical Engineering Congress and Exposition, New York, NY, 2001.

R.A. DaSilva, J. Chen, High Stress Elastic Materials, Proceedings of the Midwest Advanced Composite Material and Processing Conference, Detroit, MI, 2000.

R.A. DaSilva, J. Chen, High Stress Elastic Materials-M98D3, National Textile Center Annual Report and Conference Proceedings, 2000, 1999, and 1998.

R.A. DaSilva, J. Chen, Characterization and Model Development of Linear Braided Textile Structures, Fiber Society Student Paper Competition, 1998.

### **REFERENCES:**

**Jerry Fanucci (Manager)**  
President and CEO - ZKX, Inc  
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**Matt Dunham (Business Partner)**  
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**Brian Merrow (Manager)**  
Program Manager – Teradyne  
Gilbert, AZ  
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**Dr. Julie Chen (Thesis Advisor)**  
Vice Chancellor for Research and Innovation – University of  
Massachusetts Lowell  
Lowell, MA  
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### **INTERESTS:**

Woodworking, cycling, writing and recording music, motorcycle racing, video production, and inventing