

p:410-701-0164 | f:410-374-7851 | www.Root3Labs.com 11408 Cronridge Drive, Suite C, Owings Mills, MD 21117

CAPABILITY STATEMENT

Root3 Labs is an engineering and device development company and recognized small business specializing in applied research, rapid prototyping, and design for manufacture for the medical device and defense industries. We help our clients turn ideas into prototypes and prototypes into finished products.

Contact us for CAGE, FEIN, & DUNS

CORE COMPETENCIES

NAICS: 541330, 541711, 541712, 541420, 332710, 332510, 326199, 335999 **PSC:** AJ44, AJ43, AJ42, AN14, AN13, AZ14, AZ13, AZ12

Mechanical Engineering	Engineering Research	System Validation
Custom Part Design/Model	Concept Generation & Design	Design Documentation
Microfluidic Systems	Micro/meso-scale Actuators	Performance Characterization
Analysis, FEA, Simulations	Material Selection/Testing	Field Test Design & Support
Design for Manufacturing	Military Application	Rapid Prototyping
Process Flow Development	Size, Weight, Power Requirements	In-house Machine Shop
Reliability, Manufacturability	System Compatibility, Ruggedization	COTS Integration
Design Maturity & Scaling	Rapid Technology Development	Practical Design Choices
Electrical Engineering	Embedded Firmware/Software	Medical Device Design
Circuit Design & Board Layout	Real-time Operating Systems	Usability and Ergonomics
PCB Fabrication/Modification	Data Collection/Visualization	Portability, Biocompatibility
Sensing & Comms (SAR, RF, BLE)	Internet of Things Deployment	Regulatory Compliance

DIFFERENTIATORS

- Registered Professional Engineering Firm by the State of Maryland
- Three FAA-licensed sUAV Commercial Pilots on staff
- ITAR-registered
- NIST 800-171 Compliant

PAST PERFORMANCE

Root3 Labs has an online <u>Portfolio</u> available showing prior work under university and commercial contracts. We've also continuously demonstrated superior performance on several US Government R&D subcontracts from February 2014 through the present. For additional details, please contact us directly.

KEY MANAGEMENT PERSONNEL

Chad Schneider, PE, MSE, President, & Founder

Mr. Schneider is a professional mechanical design engineer with over 20 years of experience in the design of complex electromechanical prototypes and products. He earned a BS in mechanical engineering with Honors from the University of Maryland, College Park and a MSE in mechanical engineering from Johns Hopkins University with a focus on haptics and medical robotics. In 2012, he founded Root3 Labs to focus on practical R&D for the medical device and defense industries. He is experienced working with startups, manufacturers, and State and Federal Government clients, named on 9 patents, a licensed sUAV Commercial Pilot, and a duly licensed professional engineer by the State of Maryland.

POC: Chad Schneider, PE chad@root3labs.com, 410-701-0164 x1



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FACILITIES AND EQUIPMENT

Root3 Labs' 7,500sf prototyping facility is in Owings Mills, MD. Design capabilities include CAD, CAM, FEA, and various engineering software. Extensive in-house resources allow quick-turn, prototype fabrication of electronics, plastic, wood, rubber, textiles, and metal components using a variety of processes.

Plastic Fabrication	Electrical & Data Collection	Machine Shop
50W Laser Cutting	Prototype PCB Machining	CNC Plasma Table
SLA 3D Printers	Electrical PCB Solder/Rework	3-axis CNC 20" x 40" VMC
Vacuum Thermoforming	Signal Generation & Monitoring	3-axis CNC 16" x 30" Mill
Silicone Molding	310g x 1mg Precision Scale	CNC Router
Textiles	Digital Microscope	Manual 9" x 42" Mill
Kevlar Sewing	High Fidelity Audio Recording	Manual 10" Lathe
High-temp Materials	6cf Prog. Environmental Chamber	TIG Welding & Brazing
Vinyl Labels	Mid-temperature Oven	Sheetmetal
Soft Goods Fabrication	Remote-piloted Camera Systems	Powder Coating & Paint

Engineering Software

Our engineering staff uses Solidworks Standard & Professional and Autodesk Product Design & Manufacturing Collection for computer aided design (CAD), finite element analysis (FEA), computer aided manufacturing (CAM), as well as other specialized design/analysis tools.

Plastic Fabrication

A pair of SLA 3D printers provide precise component prototyping in a variety of materials including biocompatible resins for dental or medical applications. A 50W laser cutter produces precision 2D components in acrylic, wood, polycarbonate, and ultern as well as fabrics, adhesive tapes, and more. The machine shop includes CNC and manual tools capable of producing accurate plastic parts. Additional capabilities include vacuum thermoforming of sheet stock, silicone molding, and painting.

Machine Shop

A 45A 2-axis CNC plasma table, 3-axis CNC Fadal VMC4020HT 15HP Production Mill, 3-axis CNC Bridgeport Series II mill, manual 9" x 42" Supermax 1.5HP mill, 3-axis CNC Router, manual 10" Rockwell lathe, manual sheet metal brake, 20T hydraulic press, 210A TIG welder, 6" x 10" Mitering Metal Bandsaw, 3HP SawStop table saw, 12" Sliding Compound Miter Saw, 14" Vertical Bandsaw, 6" x 42" Belt Sander, and numerous handtools can fabricate most custom parts in metal, plastic, or wood. Depending upon the materials, parts can be finished on-site using black oxide, powder coating, paint, and CNC-cut vinyl.

Data Collection & Characterization

For testing and characterizing prototypes, an AES LH-6 environmental chamber can be configured for heating/cooling and humidity to simulate extreme operating conditions as well as program long-term storage profiles. High-fidelity, multi-channel audio recording equipment produces accurate references for equipment-produced sound levels. Multifunction 22-bit DAQ devices and development I/O boards allow simple control and data collection using various sensors and actuators. Other precision equipment includes a 0-310g x 1mg scale, 90x 5MP USB3 microscope, multi-range DC programmable power supplies, oscilloscope, and signal generator, all of which connect to a PC for monitoring, data collection, and control.