Jeffrey D. Davis

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GENERAL AREAS OF EXPERTISE:

Solidworks, Drafting, CAD Product Design, prototype modeling and assembly, manufacturing feasibility, 3D printing, machining, plastic injection molding, automation, maintenance, carpentry, gardening, and landscaping.

TOOL AND DIE MACHINIST: 13+ years

Over my career, I have had the pleasure of continually working in an environment that required research, intuition, prototype machining, clever fixturing, and on the fly thinking. I have both manually and CNC machined hundreds of complex parts, components, prototypes, and plastic injection molds with my hands and my mind. (To especially include vertical plastic injection over-molding machines, heavy machinery, and medical devices).
To accomplish this feat, I routinely utilize shop equipment and skills such as:

❖ **MANUAL MILLING MACHINES**
  ➢ Milling, drilling, tapping, reaming, fly-cutting, surfacing,
  ➢ Tolerances around +-0.001"
  ➢ Precisely tram in mill heads, vises, and mill tables utilizing precision dial indicators
  ➢ Work-holding and fixturing
  ➢ Purchasing of HSS endmills, carbide endmills, tapered endmills, ball nose endmills, bull nose endmills, boring bars, cutting fluid, honing oil, taps, drills and other support materials

❖ **HURCO 4-AXIS CNC MILLING MACHINES**
  ➢ Researched and procured appropriate machinery
  ➢ Trained on-site at HURCO's headquarters in Indiana for CNC programming
  ➢ Programmed and ran hundreds of programs with Mastercam9, MastercamX5, and HURCO's built in programming software
  ➢ Convert older FANUC files to modern CAM files
  ➢ Directly edit G-code to manipulate processes

❖ **MANUAL LATHE WORK**
  ➢ Both "collet" and "jaw" setups
  ➢ Drilling, tapping, reaming, boring, polishing
  ➢ tolerances around 0.001"
  ➢ Purchasing of lathe bits and other needed support materials

❖ **HURCO CNC LATHE WORK**
  ➢ Researched and procured appropriate machinery
  ➢ Trained on-site at HURCO's headquarters in Indiana for CNC programming
  ➢ Received certificate
  ➢ Programmed and ran hundreds of programs with Mastercam9, MastercamX5, and HURCO's built in programming software

❖ **SURFACE GRINDER**
  ➢ Balancing and dressing wheels
  ➢ Dressing the surface magnet and tramming in fixtures
  ➢ Dressing complex shapes and angles into grinding wheels
  ➢ Grinding round components such as pins
  ➢ Tolerances around 0.0005" for precise part finishing
  ➢ Purchasing of grinding wheels, diamonds, and other needed support materials

❖ **MITUTOYO SEMI-AUTOMATIC SURFACE GRINDER**
  ➢ Setup simple automated grinding tasks
  ➢ Dress wheels and surface plates
  ➢ Configure fixtures for work holding

❖ **Excello Sinker EDM (electronic discharge machine)**
  ➢ Setup parts
  ➢ Setup electrodes
  ➢ Touch off electrodes
  ➢ Calculate overburn
  ➢ Electrode design
  ➢ Configure fixtures for electrode and stock holding

❖ **VARIOUS INSPECTION ITEMS AND EQUIPMENT**
  ➢ Read and interpret part, electrical, and hydraulic schematics
  ➢ Utilize optical comparators
  ➢ Vision systems
  ➢ Scales, standard micrometers, depth micrometers, calipers (vernier)
  ➢ Dial indicators of varying type and accuracy
  ➢ Bore gauges, telescoping gauges, pin gauges (or plug if you prefer), gauge blocks,
  ➢ Sine bars, angle blocks, V-Blocks, granite surface plates
  ➢ Grind-all fixtures

❖ **WORK WITH STANDARD AND EXOTIC MATERIALS**
  ➢ Nitinol, steel, stainless steel, 420, 316, air grade aluminum, anodized aluminum, delrin, PTFE

CAD DESIGNER AND DRAFTSPERSON: 13+ years

In tandem with my journey as a research and development engineer, I have also gleaned the art of CAD design and drafting. An extraordinary amount of Solidworks files have crossed my computer screen. Projects usually range anywhere between fully automated top down assemblies of machinery; to intervascular catheter hubs for the medical device sector.

Please, feel free to peruse some of the tasks I've mastered over time below;

- ➢ Conceived and designed hundreds of solid models for the medical device and aerospace industries utilizing Solidworks CAD software
- ➢ Design ultrasonic welding joints and mates
- ➢ Calculate and translate units between metric and imperial
- ➢ Compare, contrast, convert; quantities, percentages, relations, mass, volume, density, buoyancy, and a wide range of other units
- ➢ Utilize solid modeling as well as surface modeling
- ➢ Create elaborate "Top down" assemblies
- ➢ Illustrate Solidworks sketches with relations and design tables
- ➢ Make multiple configurations for parts
- ➢ Redline and revise drawings
- ➢ Track revisions
- ➢ Harness the realview graphics and Solidworks backgrounds editor to create life-like images of products and part models
- ➢ Exploded views and animated assemblies
- ➢ 2D component drawings with tolerances and other crucial information
- ➢ Share files amongst others with .step, parasolid, and .stl formatting
- ➢ Create 3D printing concise components
- ➢ Create components that can be machined/manufactured in the real world

RESEARCH DEVELOPMENT AND AUTOMATION ENGINEER: 10+ years

The height of my career thus far has been the opportunity to flourish in the research, development, and automation field. Although electronics have been a passion of mine since being a kid; experience in the real industrial world can't be beat. I absolutely love the challenge of a new project's tentacles that must be gently discovered and untangled. Thinking outside the realm of "The Box'' is my specialty. I enjoy conceiving and producing new ideas. Prototypes are AWESOME; and I have had the honor of gaining much experience in the product research, development, prototyping, and automation fields.

Some tasks readily performed that come to mind;

- ❖ **The Ability to Utilize Microcontroller Technology**
  - ➢ PICC, Atmel, Basic Stamp, Arduino Uno, ATmega328, Adafruit spinoffs, Z80 processors
  - ➢ Atmel studio and other programming IDEs
  - ➢ C variation programming language

- ❖ **Single-board computer Technology**
  - ➢ Raspberry Pi, Beagle Bone
  - ➢ python programming language

- ❖ **Marry microcontrollers and computers to create physical outputs/inputs to the real world.**

- ❖ **Complex prototype circuitry and PCBs**
  - ➢ Soldering, de-soldering, reverse engineering, testing
  - ➢ Resistors, capacitors, diodes, transistors, logic gates, push buttons, relays, etc...
  - ➢ Design and procure prototype PCBs

- ❖ **Interact with various industrial controls and motors**
  - ➢ Servo motors, stepper motors, lights, buzzers, induction heaters, pneumatic manifolds, solenoids, PLCs, power supplies, linear actuators, transducers, and sensors of all shapes and sizes

- ❖ **Design and produce electro-pneumatic devices and fixturing**
- ❖ **Production assembly equipment to manufacture parts**
- ❖ **Apply tools such as, oscilloscopes, multimeters, logic probes, signal generators**
- ❖ **Hack, modify, Frankenstein, and adjust existing machinery to be more efficient or do new tasks**
- ❖ **Design components with 3D printing in mind**
- ❖ **Utilize 3D printing technology**

Work History:
(In Chronological Order)

Harolds JayC ~ *(2004-2006)*
~Stock Room~

United States Air Force ~ *(Oct. 2006 - Oct. 2011)*
~Active Duty~

Illinois Precision Corporation ~ (0ct. 2010 - Jan. 2017) 7+years
~Tool and Die Machinist / Heavy Equipment Manufacturing~

General Duties:
- ➢ Operate the full range of manual machine shop equipment including CNC lathes and mills.
  - ➢ Create CNC programs for all ECHO and HS2V vertical injection molding machines
    - ➢ Create CNC programs for prototypes and electrodes
    - ➢ Create solid models of customer parts, molds, and fixtures
  - ➢ Design customer parts that can be realistically manufactured, based on their input
    - ➢ Design and produce complex plastic injection molds and fixtures
    - ➢ Assemble plastic injection machinery from the ground up
    - ➢ Regularly work with hydraulic, pneumatic, and electrical systems
      - ➢ Wire plastic injection molding machinery
      - ➢ Populate and test PCB for older machines
    - ➢ Maintenance on fleet of machine shop and production equipment
    - ➢ Order tools and raw stock for various prototype and production runs
      - ➢ Attend training to stay on top of industry capabilities
        - ➢ Train staff on machine and tooling operation

Vascutech Medical ~ (Jan. 2017 - Mar. 2024) 7+years
~Research, Development, Product Design, and Automation Engineering~

General Duties:
- Design complex medical devices for the intravascular industry
- Review customer requirements to create alluring and functional parts
- Research requirements and calculate variables needed to ensure manufacturability
- Be knowledgeable in a wide range of manufacturing processes such as molding, extruding, forming, and machining to aide in product design
- Be up to date on current world manufacturing practices to capitalize on new technologies
- Develop unique manufacturing methods to create complex parts and machines
- Design, machine, 3D print, and assemble customer device prototypes
- Design manufacturing equipment such as molds, fixtures, and automated assembly aides
- Collaborate with customers to design a product they are comfortable with
- Measure, test, verify, and qualify samples and prototypes
- Order stock and equipment for the shop and customer projects
- Source customer tooling from overseas and domestic vendors
- Create, compare, and contrast schematics
- Be knowledgeable of ISO and FDA requirements
- Train and supervise staff on tooling and equipment
- Maintenance on production equipment
- Automating production for faster output
- Troubleshoot manufacturing issues and equipment

Education:

High school
Diploma earned in conjunction with Twin Rivers Building Trades Program for Construction Certificate in Bicknell, IN

College
School ~ Vincennes University (2012-2020)
Degree ~ Associates of Science – GPA 3.2+
Area of study ~ Electrical Engineering and Mathematics

School ~ University of North Dakota
Degree ~ BSEE (80% Completed with an overall GPA of 3.0+)
Area of Study ~ Electrical Engineering

More than one hundred course hours relating to topics such as trigonometry, calculus, magnetic fields, electric drives, statics, digital electronics, circuit analysis, signal processing

About myself:
My Wife and Children are top priority in my life. I have three children ranging from 11 to 18. I have a love for the outdoors, microcontrollers, animals, metal detecting, antiques, construction, and a good mind challenge. I work best alone (mostly to think); but a teams are easily navigated as well. I have a strong and incredibly dependable work ethic, as well as a great amount of pride in the work I'm tasked to do. I value honesty and equal opportunities for all.

Thank You for Your Time!