PHILLIP A. SOUCY

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PROFESSIONAL PROFILE

'Versatile, goal-oriented engineer fluent in material mechanics, with broad experiences contributing high-value solutions in fast-paced startup culture.'

With extensive high-demand experience and a Master's in Mechanics of Materials, I have a proven ability to join small teams with unique technical challenges and contribute meaningful technical results. Through design, practical hands-on skills, and analytical reasoning, I consistently deliver efficient and robust solutions.

CORE SKILLS

- Technical Writing
- Interpersonal Communication
- Project Management
- Test Design and Execution
- Hands-on Ability
- CAD (Solidworks, NX)
- Engineering Design
- Sensor Integration
- FEA (Abaqus/CAE)
- Practical Programming

CAREER SUMMARY

MKE Composites, Inc.

Senior Mechanical Engineer — *January 2019 – Present*

Outline

Collaborated with a diverse, fast-paced team using scrum methodology to deliver a proof-of-concept carbon fiber additive manufacturing system, resulting in company acquisition.

Key Responsibilities and Achievements

- Designed, prototyped, and integrated kinematic coupling mechanism for tool changing. New design required less expensive machined parts and utilized more COTS components.
- Wrote custom G-code and system configuration files for machine control, tool changing macros, motion system characterization testing, and product demonstrations.
- Coordinated with vendors and technical experts to reduce critical lead and internal product/process development times.

N12 Technologies, Inc.

Lead Mechanical Engineer, Ohio Operations — *January 2018 – November 2018*

Outline

Overseeing all mechanical and industrial design upgrades of N12's next-generation production CVD reactor, including related facility upgrades.

Key Responsibilities and Achievements

- Technical lead and liaison for industrial CVD reactor retrofits and upgrade projects surrounding Ohio manufacturing facility stand-up.
- Worked with management to implement outsourced engineering operating model which enabled an effective increase in team capacity. Allowed company resources to focus on core competencies while keeping capital expenditure down during expansion.
- Managed the design, fabrication and installation of robot-loaded high-temperature conveying system, which enabled a 3x increase in capacity. Project budget of $0.5M.
- Designed staffing, operational flow, and all support infrastructure for the conveyor.
- Oversaw all simulations performed for engineering team. Worked with external vendors to ensure on-time and on-budget delivery of realistic and reliable results.

Production Engineer *May 2017 – December 2017*

Outline
Managed the maintenance and development program of N12's first production CVD reactor, leading to significant improvements in machine up-time, more stable base-state, and reductions in unplanned maintenance.

Key Responsibilities and Achievements
- Spearheaded CVD reactor improvement program, resulting in 40-point improvement in production factor of OEE within 5-month period.
- Introduced "customer-focused" internal engineering model; solicited direct feedback from operators, resulting in significant improvement in operator quality-of-work.
- Designed, built, and supported custom laser micrometry equipment for quality control. Allowed production to move away from SEM imaging and reduced feedback time of quality metrics from weeks to minutes.
- Developed, implemented, and maintained CVD reactor maintenance log, which reduced downtime during planned maintenance and problem-solving efforts.

Massachusetts Materials Technologies LLC
Co-Founder, Research Engineer, Safety Officer *March 2015 – April 2017*

Outline
Specialized in intellectual property and lead fracture toughness research. Lead primary research and development operations for development and validation of Fracture Toughness Tester (FTT) proof-of-concept.

Key Responsibilities and Achievements
- Designed and fabricated proof-of-concept method and apparatus capable of minimally-destructive evaluation of ductile metal fracture toughness.
- Supported mechanical design team during production phases by proofing technical drawings, sourcing material, milling and turning parts, and assembling sub-assemblies.
- Drafted sections of, created illustrations for, and coordinated submission of 4 US utility patent applications (1 award), as well as several provisional applications.
- Developed and maintained on-site safety program, including Chemical Hygiene Plan.

Materials and Engineering Group LLC
Engineering Consultant *October 2013 – April 2017*

Outline
Working directly under the Principal Engineer, I performed and supported experiments and analyses for use in litigation of cases involving material failure.

Key Responsibilities and Achievements
- Developed and implemented evidence teardown procedures, including organizing inspection events hosting several engineering firms.
- Designed, fabricated, and operated test fixtures for exemplar samples to verify failure hypotheses and analytical findings. Recorded and organized results.
- Drafted memos and reports for clients on analytical and experimental results.

Keurig, Inc.
Brewer Engineering Co-op *January 2013 – August 2013*

Outline

Supported Brewer Engineering team on the design and testing of in-production and pre-production brewer systems. Primarily focused on test fixture design and implementation.

Key Responsibilities and Achievements

- Developed and implemented automated life-cycle testing apparatuses utilizing open-source electronics and programming.
- Diagnosed brewer failures and implemented prototype corrective components.
- Processed and analyzed data for internal engineering R&D qualification.
- Presented test program data to engineering and manufacturing teams in US and China.

PATENTS

Awards

U.S. Patent 9,933,346: "Contact mechanic tests using stylus alignment to probe material properties", April 3, 2018.

Applications

US20180275035A1: "Measurement of material properties under local tensile stress through contact mechanics", September 27, 2018.

RESEARCH EXPERIENCE

Northeastern Dept. of Mechanical and Industrial Engineering

Handgrip Force and Stylus Strain Relationship for Parkinson's Disease Assessment

Outline

Analytically reduced and modeled the grasping of a pen to determine a fundamental relationship between applied writing grip force and body strain. The resulting relationship enables medical researchers to develop devices which can simply and non-invasively collect handgrip information, which has been described as one of the best describing factors of the manifestation and progression of PD.

Key Responsibilities and Achievements

- Reduced simplified loading geometry to represent a subject gripping a pen
- Derived analytical equations to represent force-strain relationship for simplified geometry
- Modified equation using results from series of Abaqus/CAE finite element simulations
- Verified equations against analytical and experimental results, to within 10% of solution

EDUCATION

Northeastern University

Master of Science, Mechanical Engineering, Mechanics of Materials *December 2017*

Select Courses: Mechatronic Systems, Control Systems, Elasticity and Plasticity, Materials Processing and Manufacturing
Honors: *summa cum laude* (GPA 3.87 / 4.00)

Bachelor of Science, Mechanical Engineering *May 2016*

Select Courses: Probability and Statistics, Microeconomics
Awards: 2014 Janet P. Mackie Good Fellowship Award
Honors: *magna cum laude* (GPA 3.76 / 4.00), Member Pi Tau Sigma (Mechanical Engineering Honor Society)
Activities: Club Wrestling, Club Cycling