

PHILLIP A. SOUCY

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PROFESSIONAL PROFILE

Adaptable and pragmatic environmentalist seeking alternative career path with positive climate impact. A proven engineer with many transferable skills, including challenge mapping, problem solving, cross-functional collaboration, and technical communication. Eager to learn.

CORE SKILLS

- Interpersonal Communication
- Technical Communication
- Problem Definition
- Solution Development
- Theoretical Appraisal
- Mechanical Intuition
- Hands-on Competency
- Practical Programming

CAREER SUMMARY

Soucy Engineering

Independent Product Development Contractor

September 2022 – Present

Outline

Self-employed engineer, seamlessly interfacing with client teams by adopting established design and communication styles to develop early-stage mechanical solutions for challenging use cases.

Key Responsibilities and Achievements

- Quickly and effectively learning niche client subject matter and nomenclature.
- Providing targeted expertise on the new product development process, namely:
 - Problem definition, concept development, technical analysis, detailed design, and functional and aesthetic prototyping.
- Independently responsible for administrative aspects of work, including coordinating scope with clients, budgeting, time tracking, invoicing and reporting.

Helbling Precision Engineering, Inc.

Project Engineer

May 2020 – September 2022

Outline

Worked alongside diverse teams to conceptualize, analyze, and prototype innovative medtech for clients around the globe. Common projects included mechanically-powered handheld devices, implantables, and robotic surgical tools.

Key Responsibilities and Achievements

- Worked in small, nimble teams (2 - 3 engineers) to conceptualize, analyze, and prototype innovative medical technology solutions for clients around the globe.
- Authored and presented weekly 1-hour client update presentations.
- Collaborated with project leads to make critical path decisions, as well as manage timelines and budgets, vendors and manufacturing experts, and client expectations.

MAKE Composites, Inc. / Desktop Metal

Senior Mechanical Engineer

January 2019 – October 2019

Outline

Collaborated with a diverse, fast-paced team using scrum methodology to deliver a proof-of-concept carbon fiber “3D printer,” resulting in company acquisition by partner, Desktop Metal.

Key Responsibilities and Achievements

- Designed, prototyped, and integrated kinematic coupling mechanism for tool changing. New design utilized more affordable machined parts and 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 for industrial nanotube reactor projects surrounding stand-up of out-of-state manufacturing facility, including retrofits and upgrades of facility and equipment.
- 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 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 multiple US utility patent applications, 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 9,897,523: "Contact mechanic tests using stylus alignment to probe material properties", February 20, 2018.

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

U.S. Patent 11,378,502: "Measurement of material properties under local tensile stress through contact mechanics", July 5, 2022.

Applications

US20210322116A1: "Surgical systems and methods for robotic actuation of continuum joints", October 21, 2021

US20220379033A1: "Reciprocating mixing and injector system", December 1, 2022

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