Vineet Padia

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Skills

Engineering Skills: Machine Design, GD&T Y14.5, Microfluidics, Statistics (ANOVA, SPC & DOE), Design for Manufacturing, Computational Fluid Dynamics, Control System Design, Finite Element Analysis
Computer Aided Drawing Packages: ProEngineer Creo, Solidworks and Siemens NX
Programming Languages: MATLAB, Python, Mathematica, and C++
Manufacturing Processes: Additive Manufacturing, Injection Molding, Extrusion, and laminated microfluidic fabrication

Education

University of Maryland College Park, MD • A. James Clark School Engineering — May 2017
Bachelor of Science in Mechanical Engineering

Work Experience

Festo Corporation

Product Development Team Lead — December 2018 – Current

- Led a cross-functional team of engineers consisting of mechanical, software, electrical and testing engineers.
- Developed new microliter and nanoliter liquid handling products for laboratory automation
- Conducted system and design FMEAs, cost analysis and optimization for newly created products
- Utilized change management process to manage documentation and product changes

Product Development Engineer — September 2017 – December 2018

- Developed simulation models to predict dispensed liquid volumes from photometric and gravimetric data
- Implemented test suite to quantifiably analyze fluid dynamic performance of system nozzles and valves.
- Responsible for end-to-end design and production of a precise portable pressure/vacuum generator.
- Established a new site capable of design, prototyping, and testing for rapid development process
- Developed customer specific fluid dispensing systems and delivering performance reports on key parameters.

Internship Experience

Formlabs | *Mechanical Engineering Intern* — June 2016 – August 2016

- Developed new concepts for film-based peel mechanisms in stereolithography
- Created a functional prototype of an ultra-violet liquid crystal display 3D printer
- Collaborated with oversea manufacturers to redesign optical sensor mounts to be compatible with multiple sensors.
- Created detailed designs in CAD and well-specified, accurate drawings

University of Maryland: Soft Matter, Interfaces, and Energy Laboratory | *Research Fellow* — October 2015 – March 2016

- Conducted research directed towards understanding double layer electrokinetics and the fluid transport involved
- Created computational fluid models in C++/MATLAB to simulate surface energies of nanoscale droplets
- Published an article in peer-reviewed journal and presented a research poster at APS Fluid Mechanics conference

W. L. Gore & Associates, Inc. | *Engineering Intern* — June 2015 – August 2015

- Designed and developed inspection devices for GORE STA-PURE Pump Tubing to measure properties of uncured tubes
- Evaluated sources of variability of the devices via ANOVA gauge repeatability and reproducibility studies

PrimeTime Life Sciences, LLC | *Engineering Intern* — June 2014 – October 2014

- Devised a microtitre pipetting guide mechanism to facilitate contamination-free liquid transfer
- Drafted high quality patent drawings for provisional patent applications and design patents

National Institutes of Health: National Center for Advancing Translational Sciences

Automation Intern — June 2013 – September 2013

- Designed a two dimensional actuated stage for implementation in a biochemical cell imaging device
- Incorporated the electromechanical device into an automation scheduling system via LabVIEW

Research Fellow — June 2012 – June 2013

- Designed a real-time optical detection system for microfluidic droplets for use in automated screening.
- Awarded a travel award to present my research at an international conference for laboratory automation
- Worked on a design which was evaluated for licensing by vendors to incorporate in robotic systems
- The research spawned into a Small Business Innovative Research Grant worth $1.7 million

Projects At University of Maryland

SpaceX Collegiate Hyperloop Competition Team | *Mechanical Design Engineer* January 2017 – May 2017

- Designed, fabricated and tested a half-scale magnetically levitated pod for the 2017 SpaceX Hyperloop Competition
- Produced NX Nastran and ADAMS design simulations to assess various stresses and vibrations of the designed pod.
- Designed and CNC-machined parts for multiple pod systems at high tolerance.
- Collaborated with 60 other student members discussing overall project updates with personal design reviews.

Real-Time Load Sensing Spinal Lumbar Interbody | *Senior Capstone Project* August 2016 – December 2016

- Led a team of students for a university collaboration with K2M Inc., a spinal implant company
- Prototyped a research tool to directly quantify spinal loads relevant to FDA clearance for spinal interbody fusion devices
- Produced a detailed report of the final design project, including thorough analysis and plans for production of CTQ systems with an estimate of the life cycle cost

Microfluidic Diodes Fabricated via Multi-jet Additive Manufacturing | *Lead* August 2016 – December 2016

- Applied advanced additive manufacturing knowledge towards microfluidics.
- Examined the design process and performance of six valve designs printed with multi-jet modeling technology
- Implemented Finite Element Analysis to create a Mathematica model of each microfluidic valve in Stoke's fluid flow.
- Produced a 'Lab on a Chip' journal-style report detailing our research and findings

Analysis and Scaling Study of a Inertial Vane Demister | *Lead* January 2015 – March 2015

- A MATLAB simulation program was developed to model a vane-impactor demister system to predict the function of a prototype demister
- Implemented parallel computing on the NIH BioWulf Cluster to expedite the drop dynamics simulation
- Documented dimensional scaling study and a critical review of results in a final report

Activities

Sandbox | *Designer* September 2014 – May 2017

- Participated in hackathon events each lasting 2 – 3 days, in which students meet to collaborate on an engineering project
- Attended weekly sessions at a hackerspace to work on projects while sharing ideas and knowledge

Maryland Cyber Challenge and Competition | *Winner* October 2012

- Competed in teams of five against six other finalist teams by protecting 10 virtual machines from "hackers"
- Received a $5,000 scholarship and an invitation to speak at the National Initiative for Cybersecurity Education workshop at the National Institute of Standard and Technology.

American Society of Mechanical Engineers | *Tutor* September 2015 – May 2017

- Tutored undergraduates in courses like Thermodynamics, Statics, Dynamics, Statistics, and Calculus

Community Service

Poolesville and Eleanor Roosevelt FIRST Robotics Teams | *Mentor* June 2012 – June 2016

- Founded a group of 40 high school students to compete in the FIRST Robotics Challenge
- Fundraised $30,000 from companies such as Leidos, Lockheed Martin, NASA, and PTC
- Mentored high school students in fundamental concepts regarding mechanical engineering and design principles

Honors and Awards

- President's Scholarship at the University of Maryland September 2013 – May 2017
- Joseph D. Byrd Scholarship September 2013 – May 2017
- College Park Scholars Outstanding Achievement Award August 2015
- A. James Clark School Dean's List September 2013 – May 2017
- Poster Award at the Society for Laboratory Automation and Screening Conference January 2013
- Tony B. Academic Award December 2012

Publications

- Shayandev Sinha, **Vineet Padia**, Kyeong Il Bae, Guang Chen, Siddhartha Das, Effect of electric double layer on electro-spreading dynamics of electrolyte drops, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Available online 23 November 2016, ISSN 0927-7757, http://dx.doi.org/10.1016/j.colsurfa.2016.11.031.
- **Vineet Padia** & Sam Micheal (2013, January). Design of an On-the-Fly Optical Detection System for Multi-Tip High-Throughput Reagent Dispensing. Poster session presented at the Society for Laboratory Automation and Screening, Orlando, FL.
- Kyeong Bae,; Shayandev Sinha; Guang Chen, **Vineet Padia**; Das, Siddhartha (2015, November). Spreading of Electrolyte Drops on Charged Surfaces: Electric Double Layer Effects on Drop Dynamics. Poster session presented at the American Physical Society Division of Fluid Mechanics Conference, Boston, MA.