VERNON S. CRASTO

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OBJECTIVE

A driven MEMS PhD grad student with consolidated understanding of design, micro-fabrication and characterization of MEMS, in pursuit of internship opportunities.

EDUCATION

PhD: E&C Engineering, University of Florida, Gainesville, FL. *August 2021- Present*

Coursework: Future of Microelectronic Technologies, Principal of MEMS Transducers, Electro-magnetic Fields and Applications, Applied Magnetism and Materials, IoT Sensors and Systems.

MS: Mech. Engineering, University of Illinois at Chicago, Chicago, IL. *May 2017*

Coursework: Microdevices and Micromachining Technology, Microsystems Design, Introduction to MEMS, Low Dimensional Nanomaterials, Finite Element Analysis.

BE: Mech. Engineering, Visvesaraya Technological University, INDIA. *May 2013*

Coursework: Advanced Mathematics, CAD/CAM, Design of Machine Elements, Mechatronics, Finite Element Analysis, Computer Integrated Manufacturing, Heat and Mass Transfer.

WORK EXPERIENCE

University of Florida, Gainesville, FL. *August 2021- Present*

Graduate Research Assistant

- Worked with NIWC to develop electromagnetic shielding solutions for patch antenna systems.
- As a member of IoT4Ag, currently involved in developing Wireless Power Transfer devices for agricultural applications.

Manipal Institute of Technology, Manipal, India. *July 2020- Present*

Junior Research Fellow

- Led the micro-fabrication team of MAHE Ocular Tribology Research Group in the development of micro surface features on contact lenses for friction measurements.
- Simultaneously worked on lithography, 3D printing and two-photon polymerization.
- Worked on implementation of Risk Management Protocols, a part of ISO:14971 and ISO:13485 standards.

BAJAJ Medical LLC, Chicago, IL. *September 2017-February 2020*

Mechanical Engineer

- Streamlined processes along packaging lines and eliminated lead times resulting in 16% increased efficiency.
- Experienced in Ladder Logic Programming and PLCs of packaging machines.
- As a team leader, delegated tasks in the packaging and labeling of pharmaceutical products.

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- Ensured component specifications as per client requirements.

UI Hospital and Health Science System, Chicago IL. *June 2016-May 2017*

Student General Assistant (on-campus)

- Managed databases of patients' appointment details.
- Interacted with health insurance companies to verify patients' insurances.

Canara Engineering Works, Mysore, India. *July 2013-June 2015*

Analysis Engineer

- Developed cutting edge 3D models of automobile engine components.
- Built and delegated tasks to teams of 7-9 members; mentored and influenced them to make decisions.

PROJECTS/PAPERS

Finite Element Analysis of Cornea and Lid Wiper during blink, with and without contact lens (Under Review). *Fall 2020*

- Manuscript has been submitted to Scientific Reports Journal on Simulations of Von-mises stress and displacement of eyelid and cornea during blink mechanism in the eye.
- Worked on sensitivity analysis of Cornea and Lid for various biophysical constants.
- Gained tremendous experience in COMSOL Multiphysics simulations.

Material Characterization of Polymer comfilcon A. *Spring 2021*

- Characterized the material properties of contact lens material, Comfilcon A, using Atomic Force Microscopy.
- Determined Young's Modulus of Comfilcon A.

Application of Digital Image Correlation to measure strain. *Spring 2021*

- Measured strains in polymer dog bone samples under load using Digital Image Correlation technique and validated the results using strain gauge.
- Developed training protocols and methodology for using the Digital Image Correlation equipment.

Wearable Electronics Project. *Spring 2021*

- Built a circuit to determine the heart rate using Infrared sensors.
- Developed an amplification circuit to amplify the feeble voltage to significant values.

Micro-fabrication Simulation of 22nm FinFET. *Spring 2021*

- Simulated layer by layer fabrication of Fins and Gate Module using Coventor.
- This project gave me an insight into the process flow of different modules-STI (Shallow Trench Isolation), Gate Module, Fins Module, Device Module, Wells Module and Back-end Metallization.

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Characterization and Testing of MEMS Devices-STMicroelectronics. *Summer 2018*

- Explored firmware programming of the STEVALKT01V1 Discovery Kit IoT board, sensor signal event detection, accelerometer orientation and event detection, audio sampling of MEMS microphone and motion data acquisition via BLE Bluetooth communication.
- Used IIR discrete time filters (Low Pass and High Pass) to modify the acquired signals.
- Calculated the acceleration-linear and angular, vector magnitudes and set a threshold acceleration value using the micro accelerometer and micro-gyroscope.

Design and Fabrication of a MEMS Thermal Actuator. *Spring 2016*

- Spearheaded a multi-disciplinary team in fabrication processes in the University's class 100 clean room.
- Demonstrated the FEA Multiphysics simulation of Joule heating and thermal expansion using ANSYS Workbench.
- Designed masks using L-edit and designed the model using SolidWorks.
- Carried out fabrication processes including spin coating, baking, exposing and developing; observed the device under SEM and tested at a probe station.

Design and Modeling of a MEMS Capacitive Accelerometer. *Spring 2016*

- Independently simulated the stability of ADXL193 (Analog Devices).
- Applied the Lumped Element Model to interpret the functionality.
- Developed a mass-spring-damper system model of the entire structure and performed multiple simulations to optimize the finger gap using MATLAB-Simulink.

Position and Velocity Control using Arduino UNO. *Spring 2017*

- Constructed an encoder using two opto-interrupters to estimate the DC motor position.
- Developed an algorithm for manipulation of DC motor shaft position and velocity.
- Used PID function to tune the system.

SKILLS

MATLAB | Simulink | L-edit (Tanner EDA) | COMSOL| Coventor | ANSYS | SolidWorks | C | C++
CREO| AutoCAD | MS Office | LabVIEW | Audacity