Gowtham Venkatraman
Mechanical Engineering (Ph.D.)

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PROFESSIONAL SUMMARY

- 8+ years of experience in process control, instrumentation, and new product introduction (NPI).
- 4+ patents and 3 journal articles published in peer-reviewed journals
- Solid team-player working with cross-functional collaborations on multiple projects.
- Proficient in technical writing, developing features at multiple TRL levels for on-machine install.

TECHNICAL SKILLSET

FEA	Instrumentation	Skills
ANSYS (Non-linear / thermal)	CAN / LIN networking	Vector CANalyzer
COMSOL Multiphysics	Electromagnetic compliance	Vibration validation testing
LS-Dyna (Explicit)	Doppler velocimetry	Statistical analysis (DOE)
HPC Cluster Computing	Infrared thermography	Smart materials
Design	**Programming**	High-frequency data analysis
AutoCAD & SolidWorks	NI LabVIEW	Metallography and SEM
Adobe Illustrator	MATLAB & Simulink	Structural characterization
Microsoft PowerPoint	Python & C#	3D motion capture and DIC
Microsoft Project	ROS 2	CNC machining (G-code)

PROFESSIONAL EMPLOYMENT HISTORY

Sr. Systems Engineer, Caterpillar Inc., Peoria, Illinois   [04/11/2022– present]

- Model, test, and validate technologies to enable next-generation smart features for excavator product.
- Coordinated with suppliers and manage a multi-functional team for design iterations, testing, customer feedback, system-level validation, and production readiness.
- Organized customer-facing engineering demos and surveys for two projects with positive feedback.
- Submitted 4+ patents to protect IP (intellectual property) for implementation in the application space.
- *Methods: Sensor DAQ, Design, Component / System Validation, J1939 CAN / LIN communication.*

Graduate Research Associate, Honda R&D Americas, Columbus, Ohio   [05/16/2021–07/15/2021]

- Reduced computation time of body-in-white crash simulations by developing simplified failure models of additively-manufactured (AM) laminate structures in LS-DYNA FE software.
- Validated simulations by designing test fixtures and measuring the multi-axial strength of AM parts.
- *Methods: Explicit structural simulations (LS-DYNA), structural testing (UTM), GD&T.*

Graduate Research/Teaching Associate, the Ohio State University, Columbus[1/1/2018–12/31/2021]

- Identified threshold parameters for UAM welding in aluminum by correlating weld parameters with the interface grain boundary energy using nanoindentation and EBSD imaging techniques.
- Conceptualized infrared imaging for in-situ monitoring of thermal power transfer in UAM.
- Built a tool to design weld parameters to embed temperature-sensitive PVDF sensors and electronics in ultrasonically welded parts by initiating a collaboration with OSU material scientists.
- Responsible for EHS compliance by calibration check and safety code conformance for the lab.

- Mentored 2 interns on research projects in UAM and responsible for evaluation and training.
- Developed a parameter-selection tool to optimize UAM welding of multi-material structures with applications in automative, aerospace, and defense industries for lightweighting and efficiency.
- Conducted assignments and labs for a course of 50+ students as teaching associate.
- *Methods: Impedance analysis, Elastoplastic / Thermal FEA, Microscopy, EBSD, Structural testing.*

Graduate Research Associate, SMSL, the Ohio State University [06/15/2015–12/31/2017]
- Designed an automated power control algorithm to improve the weld strength by 22% to predict weld energy as a function of material and fixture geometry.
- Built a tool to improved weld quality by modifying UAM fixture design and the process efficiency using experimental modal analysis and finite element analysis (FEA) to build a process energy map.
- Instrumented an in-situ non-destructive weld quality prediction system that signaled the success of a UAM weld by monitoring the 20 kHz vibrations in the Fourier domain using Doppler velocimetry.
- Developed an analytical tool for wireless processing of PVDF sensor data embedded in vehicle tires.
- *Methods: Data analysis (LabVIEW), Multiphysics FEA (COMSOL), CNC, scanning vibrometer.*

Intern, Caterpillar Inc., Chennai, India [05/01/2014-12/31/2014]
- Developed a software applet to optimize orifice selection for hoist applications using Visual Studio.

Intern, LG Electronics, Noida, India [05/01/2013-07/31/2013]
- Designed and prototyped a convertible freezer design using ANSYS and validated energy savings.

EDUCATION
Ph.D. in Mechanical Engineering, The Ohio State University, Columbus [06/15/2015-01/07/2022]
    Specialization: Additive manufacturing, Dynamical systems, Multiphysics modeling
    Thesis: "Process Modeling of Ultrasonic Additive Manufacturing"
    Select courses: Nonlinear systems, Intelligent control, Optimal control, Design and analysis of experiments, Advanced CAE simulation, Constitutive material models, Fundamentals of SEM.
B.Tech. (Honors) in Mechanical Engineering, IIT Madras, India [08/01/2011–05/31/2015]

SELECT PUBLICATIONS
- Venkatraman, G., Hehr, A., Headings, L. and Dapino, M., "Effect of system compliance on weld power in ultrasonic additive manufacturing". Rapid Prototyping Journal (2021).
- Venkatraman, G., Shah, U., Liu. X., Dapino, M., "In-situ IR imaging for modeling heat transfer in the ultrasonic additive manufacturing process", CIRP-JMST (2022).

HONORS
NSF Summer Scholars Internship Program (SSIP) award [March 2021]
- Awarded a competitive national grant given to students for exceptional work on NSF grants.

LEADERSHIP, SERVICE AND OUTREACH
Endorsement for Inclusive Teaching, The Ohio State University [April 2021]
- Received an endorsement for inclusive teaching as LabVIEW instructor / grader for 35 UG students.

International Leadership Scholarship, The Ohio State University [March 2020]
- One of 10 recipients in the university. Awarded for presiding over a volunteer student organization that raises awareness for social welfare organizations and raised over $5000 every year since 2018.

Instructor, NSF East High School outreach program [Aug-Sep 2016 and 2017]