SWAPNIL SURYAKANT SALVI

1002, Greek Row Dr. #320, Arlington, TX 76013
swapnilsuryakan.salvi@mavs.uta.edu, +1 (682) 256-5914
www.swapnilsalvi.com

To get an engineering internship/co-op position where I can fully utilize my analytical and experimental ability. Experimental hands-on experience in heat transfer measurements of microelectronic devices, thin wires and additively manufactured parts. Solid technical understanding of thermal and fluid transport principles. Competent in thermal property measurement of solids and liquids. Proficient in numerical and computational programming in MATLAB. Team player with problem solving skills and motivation to accomplish engineering challenges.

TECHNICAL SKILLS

CAD Design Software: SOLIDWORKS, PRO-E, AutoCAD
Scientific Programming: MATLAB, Mathematica
Finite Element/CFD Software: COMSOL, ANSYS Fluent, ANSYS Icepak
Experiment Design Software: NI LabVIEW, SIMULINK.
Thermal Property measurement: Thermal characterization- Light Flash Apparatus (LFA), Transient Plane Source (TPS), Two thickness method (Fox50), Thermal Imaging / Infrared (IR) Camera
Semiconductor fabrication: Microfabrication process development and specification, cleanroom fabrication techniques, lithography, thin film chemical vapor deposition, rapid thermal anneal, surface resistance measurement, dry/wet etching, furnace oxidation, Ellipsometry, hands-on chemical training.
Other: Microsoft Office, Origin.

EDUCATION

Ph.D. Mechanical Engineering — **Expected - May 2021**
University of Texas at Arlington – Arlington, TX — *GPA: 4.00/4.00*
Master of Technology, Mechanical Engineering — **July 2016 - May 2018**
Indian Institute of Technology Ropar — *GPA: 3.46/4.00*
Bachelor of Engineering, Mechanical Engineering — **July 2013 - April 2016**
University of Mumbai — *GPA: 3.58/4.00*

PROJECTS

Effect of copper nanoparticles on the thermal characterization of additive manufacturing products **June 2019 - Present**

- Using extruded ABS filaments infused with the copper nanoparticles in customizable concentrations
- Measured thermal conductivity of the polymer filaments using the concept of fins
- Measured thermal conductivity of additively manufactured parts using one dimensional heat flux method (Fox50)

Detection of unusual thermal activities in 3D-IC using Infrared Camera **August 2018 - Present**

- Designed a fixture and carried out experiments to detect unusual thermal activity in a multi-die IC packaging.
- Recorded thermal signatures of the transistor plane using infrared camera.
- Carried out image processing using various machine learning algorithms such as Structural Similarity Index Method (SSIM), 2D Correlation Coefficient Method, etc. to detect anomalous thermal activity on the chip.
- Analyzed trade-offs in detection accuracy and speeds, as well as false positives and negatives.

Thermal conductivity measurement of thin wires using the fin effect **August 2018 – October 2019**

- Designed an experiment to measure the thermal conductivity for different wires of similar/dissimilar diameters.
- Measured temperature distribution data utilizing Infrared Camera.
- Derived a model for thermal conductivity measurement based on the theory of heat transfer in extended surfaces (fins).
- Applying the developed experimental technique to measure thermal conductivity of composite solder wires.

Numerical Analysis of Phase Change Materials (PCM) for use in Energy Efficient Buildings **June 2017 - May 2018**

- Derived a multiphase heat transfer model of a composite wall with PCM in COMSOL.
- Analyzed various Phase Changing Materials (PCMs) as a working medium for latent heat thermal storage systems.

RELEVANT GRADUATE-LEVEL COURSEWORK

Design of Experiments (Spring 2020), Silicon Integrated Circuit Fabrication Technology, Convection Heat Transfer, Thermal Conduction, Advanced Classical Thermodynamics, Analytic Methods in Engineering, Fluid Dynamics

PROFESSIONAL WORK EXPERIENCE

Research Assistantship **August 2018 - Present**

Microscale Thermophysics Laboratory, The University of Texas at Arlington.

- Capable of measuring the thermal conductivity of wires of different materials.
- Designed the VI in LabVIEW to collect the high-frequency experimental data and used MATLAB to analyze the data.
- Experienced in operating Light Flash Apparatus (LFA), Transient Plane Source (TPS), Two thickness method (Fox50).
- Experienced in operating polymer 3-D printer
- Experienced in thermal imaging using Infrared (IR) camera customized with various IR-Optical tools.

PUBLICATIONS

- Salvi, S. S., Jain, A., "Detection of Unusual Thermal Activities in 3D IC using IR Thermal Imaging utilizing various Image Processing Techniques", *[In preparation].*
- Salvi, S. S., Jain, A., “Measurement of Thermal Conductivity of Thin Wires using the Fin Effect", *[Under Review]*.
- Salvi, S. S., Bhalla, V., Taylor, R. A., Khullar, V., Otanicar, T. O., Phelan, P. E., and Tyagi, H., "Technological Advances to Maximize Solar Collector Energy Output: A Review", *ASME Journal of Electronic Packaging*, Vol. 140(4), p. 040802. [DOI: 10.1115/1.4041219]

ACCOMPLISHMENTS

- Mechanical and Aerospace Engineering STEM fellowship (August 2018 – Present).