

Postdoctoral Associate with expertise in mechanical design, thermal, and fluid sciences. Committed to applying engineering principles in design, analysis, and problem-solving to drive innovation and excellence in impactful projects. Seeking a challenging role to leverage applied research experience for breakthrough advancements.

Education

Ph.D. , Mechanical Engineering, University of Florida, Gainesville, FL	May 2024
Thesis: <i>Physics of Critical Heat Flux - Answers to Century Old Questions and New Discoveries</i>	GPA: 3.9/4.0
MS , Mechanical Engineering, University of Illinois at Chicago, Chicago, IL	Jan 2020
Thesis: <i>Partial Coalescence of Oil and Water: Spreading Behavior and Material Synthesis</i>	GPA: 3.7/4.0
B.Tech. , Mechanical Engineering, Jawaharlal Nehru Technological University, Hyderabad, India	Jun 2017
Senior Design: <i>Design and analysis of guide rods of an automotive head restraint</i>	GPA: 3.6/4.0

Relevant Coursework

Fluid mechanics I & II; Advanced transport phenomena; Phase-change heat transfer; Computational fluid dynamics; Energy storage; Thermodynamics; Applied stress analysis; Conduction heat transfer; Convection heat transfer; Heating, Ventilation & Air Conditioning; Mechanics of solids; Fundamentals of Machine learning.

Experience

University of Florida, Mechanical & Aerospace Engineering Gainesville, FL
Postdoctoral Associate May 2024 - Present

- Lead a team of 5 graduate students and a Post-Doctoral researcher to develop direct-to-chip phase change cooling technology for data centers, successfully bringing technology readiness level (TRL) from 3 to 6.
- Collaborate with engineering, manufacturing, and reliability teams to develop scalable packaging processes.
- Perform techno-economic analyses (TEA) to assess commercialization feasibility of heat sinks.

Graduate Research Assistant Aug 2020 - May 2024

- Demonstrated a proof-of-concept (TRL 3) phase change heat sink for data center environments.
- Achieved a 5× improvement in heat transfer coefficient (HTC) compared to state-of-the-art technologies.
- Conceptualized, investigated and explained physics of critical heat flux (CHF) during pool boiling.
- Achieved a 6× increase in CHF through flow stabilization and developed force balance based correlations.
- Developed heat pipes for thermal management in low gravity environments and confined spaces.

Airity Technologies Redwood City, CA

Mechanical Engineering Intern May 2023 - Aug 2023

- Led a team of 3 interns towards product development of a high voltage module, bringing technology to market.
- Created bill of materials (BOM) for high-volume manufacturing and contributed towards patent applications.
- Designed, fabricated, and tested mechanical components for high-voltage power electronic systems.
- Procured thermal interface materials and heat sinks based on electrical, thermal, and mechanical requirements.

University of Illinois at Chicago, Mechanical & Industrial Engineering Chicago, IL

Graduate Research Assistant Jan 2018 - Mar 2020

- Investigated oil drop interaction with water-air interfaces in context of oil spills.
- Designed and conducted experiments, and established scaling laws to predict coalescence and spreading of oils.
- Investigated freezing and rebound of drops on sublimating surfaces to aid the design of self-cleaning surfaces.
- Leveraged principles of solid mechanics, heat transfer, and fluid mechanics to conduct experiments and formulate models that predict the freezing and rebound characteristics of drops.

Experience

Satyam Venture Engineering Services, *BMW Division*
Design Intern

Hyderabad, India
Nov 2016 - May 2017

- Created CAD models of guide rods of an automotive head restraint using design and GD&T specifications.
- Performed structural analysis simulating a rear end collision on a BMW sedan.
- Improved passenger safety by 8% by optimizing design to minimize severity of whiplash effect.

Skills

- **Laboratory** - Photolithography; Deposition (sputtering, PECVD, E-beam); Etching (wet, DRIE); Electroplating; SEM; High-speed imaging; Confocal microscopy; Tensiometry; Interferometry; Prototyping; CNC; cold welding
- **Design & Analysis** - Solidworks; AutoCAD; GD&T; Fusion 360; COMSOL; ANSYS Mechanical, Fluent; Python (SciPy, numPy, OpenCV, TensorFlow, matplotlib, scikit-learn); MATLAB; Fortran;
- **Mathematics** - Numerical methods; Scaling analysis; Linear ODEs; Asymptotic analysis
- **Documentation** - MS Word, Excel, Powerpoint; Adobe Illustrator, Premiere Pro; \LaTeX
- **Software** - C; ImageJ; OriginPro; KLayout

Selected Journal Publications

(For a full list of publications, visit my [Google Scholar](#) page.)

1. **Tamvada, S.** & Moghaddam, S., *Data center energy efficiency enhancement potential of a membrane-assisted phase-change heat sink*. Applied Thermal Engineering (2023).
2. **Tamvada, S.R.**, Attinger, D., & Moghaddam, S., *On critical heat flux and its evaporation momentum and hydrodynamic limits*. International Journal of Heat and Mass Transfer (2023).
3. Kulkarni, V., Lolla, V. Y.*, **Tamvada, S.R.***, Shirdade, N., & Anand, S., *Coalescence and spreading of drops on liquid pools*. Journal of Colloid and Interface Science (2021). (*equal contribution)
4. Kulkarni, V., **Tamvada, S.R.** Shirdade, N., et al., *Increased solidification delays fragmentation and suppresses rebound of impacting drops*. Physical Review Fluids (2024).

Media Coverage

- B. Crosbie, "Grad student Sahas Tamvada achieves influential discovery in heat transfer." Mar 2023
- D. Staudacher, "Researchers looking at oil and water interaction to prevent water contamination." Apr 2021

Awards

- Mechanical and Aerospace Engineering Graduate student research award. May 2024
- Travel award for IEEE iTherm Conference. May 2024
- Travel award for ASME Summer Heat Transfer Conference. May 2022
- Third place - MAE Student poster competition, University of Florida, Gainesville, FL. Apr 2022

Volunteer/Leadership activities

- Reviewer for IEEE Access and IEEE iTherm.
- Mentored 10+ graduate students towards their MS research work.
- Conducted summer workshops for high-school students interested in STEM degrees.
- Evaluated research as judge at the Chicago Area Undergraduate Research Symposium (CAURS) 2019.
- Led a team of 15 graduate students in organizing semi-annual cultural festivals as president of Indian Graduate Student Association (IGSA) at University of Illinois at Chicago from June 2018 to August 2019.
- Led a team of 5 volunteers in developing teaching modules and conducting co-curricular workshops for middle school students as project coordinator at Becoming I Foundation, India, from January 2016 to July 2017.