Venkatsai Bellala

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www.bellala.org

Education

Warren Alpert Medical School of Brown University — Providence, RI

M.D. — *Aug. 2024 - Expected May 2028*

- **Extracurriculars:** 2025-26 Emergency Medicine & Critical Care Interest Group (Leader), 2025-26 Interventional Radiology Interest Group (Leader), 2025 Anesthesia Pre-Clinical Elective (Leader), 2024-25 PM&R Interest Group (Leader), MSDCI Chapter (Leader), Breeze Against Wheeze (Treasurer), Medical Student Research Advisory Committee, Early Anesthesia Career Exploration, Research, and Advocacy Program
- **Relevant Courses:** Interventional Radiology PCE, Anesthesia PCE, Gastroenterology PCE, Planetary Health PCE

Brown University — Providence, RI

Sc.B. Biomedical Engineering with Honors · Program in Liberal Medical Education · GPA: 4.00 — *Sep. 2020 - May 2024*

Research Experience

School of Engineering — Brown University

Senior Capstone Design · Advisors: Anubhav Tripathi, PhD; Sakina Sojar, MD; Patrick Lee, PharmD — *Sep. 2023 - Present*

- Led mechanical design of a novel device for sequential IV delivery of small volume drugs, replacing the 3-way stopcock
- Conduct IRB-approved clinical study with 100 providers to validate design and integrate user feedback
- Intend to file provisional patent before submission of utility patent
- Awarded $10,000 across 2 grants for device research and development

The Srivastava Research Lab — Brown University

Engineering Research Assistant · Advisor: Vikas Srivastava, PhD — *July 2020 - May 2024*

- Investigate effect of applied mechanical loading on the function and expression of brain cell populations
- Create polymeric gel surrogates to mimic the mechanical properties of the extracellular matrix
- Conduct environmental stress cracking (ESC) and slow crack growth tests of high-density polyethylene (HDPE) under varied temperatures and exposure to chemical surfactants

School of Engineering — Brown University

Design Project · Advisors: David Borton, PhD; Barry Bannister — *Sep. 2023 - May 2024*

- Co-developed a low-cost personalized hand tool for individuals with spinal cord injuries to improve mobility and quality of life
- Consulted with patients and physical therapists to gain insight into the unique needs of those with spinal cord injuries
- Secured $10,000 in funding through two grants for device development

Summer Undergraduate Research Fellowship — Mayo Clinic

Summer Research Intern · Advisor: Yuguang Liu, PhD — *May - August 2023*

- Investigated feasibility of 3D printing microstructures to be integrated into digital microfluidic platforms under Yuguang Liu, PhD and Seth Nfonoyim-Hara, PhD
- Achieved precise structures by balancing parameters like laser power, velocity, and substrate degradation
- Contributed to the development of functional and efficient cell capture technologies

Applied Interdisciplinary Research in Air — Virginia Tech

Summer Research Intern · Advisor: Linsey Marr, PhD — *May - July 2022*

- Investigated the impact of dry bulb temperature, relative humidity, absolute humidity, and indoor activity on the instantaneous reproduction number (R_t) of SARS-CoV-2
- Utilized R language to compute R_t from daily COVID-19 surveillance data with the EpiEstim package, process and examine meteorological, behavioral, and incidence data, generate linear regression models, and plot results
- Opportunity funded by the National Science Foundation's Research Experience for Undergraduates

Teaching Experience

Brown Design Workshop (BDW) — Brown University

Monitor — *Jan. 2022 - Present*

- Facilitate approved workshops to educate small (5-6) groups of students on proper use of BDW tools and materials
- Foster a safe learning environment through encouraging creative problem solving and exploration of design principles

Brown Office of Residential Life — Providence, RI

Community Coordinator — *Sep. 2022 - May 2024*

- Cultivate an engaging and educational physical space with creative, educational bulletin boards and displays that promote community values, learning, and resources
- Assist individuals with personal, social, and academic concerns in an atmosphere of support, discretion, and privacy

- Post or distribute notices and information to residents as directed

School of Engineering Brown University
Engineering Teaching Assistant *Sep. 2021 - May 2024*
- ENGN1210 (Biomechanics), ENGN1230 (Instrumentation Design), ENGN1490 (Biomaterials), ENGN0040 (Dynamics and Vibrations), ENGN0032 (Introduction to Engineering: Design)

Meiklejohn Peer Advising Program Providence, RI
Meiklejohn Peer Advisor *Sep. 2021 - May 2024*
- Mentor a small (5-6) group of first-year students through their transition to university life
- Write supplemental advising commentaries to explain and demystify college experiences
- Coordinate meetings to evaluate course selections and address student concerns and questions

Publications

[1] S. Niu, **V. Bellala**, D. A. Qureshi, and V. Srivastava, "A machine learning method to characterize the crack length and position in high-density polyethylene using ultrasound," 2023. Publisher: arXiv Version Number: 1.

Presentations and Posters

View more presentations and posters at `bellala.org/research`.

[1] E. E. Ozcan, **V. Bellala**, A. Q. Wu, C. J. Shin, T. Meng-Saccoccio, P. Ogan, P. H. Lee, and S. H. Sojar, "A novel rapid delivery device for intravenous adenosine administration," 2024. Presented at *50th Northeast Bioengineering Conference* at Stevens Institute of Technology.

[2] T. Meng-Saccoccio, C. J. Shin, P. Ogan, E. E. Ozcan, **V. Bellala**, A. Q. Wu, P. H. Lee, and S. H. Sojar, "Fluid dynamics of the three-way stopcock: simulation and experimental validation," 2024. Presented at *50th Northeast Bioengineering Conference* at Stevens Institute of Technology.

[3] **V. Bellala**, K. Palac, K. LoGiudice, and V. Srivastava, "Mechanical properties and cellular function impairment of brain tissue mimicking surrogates," 2024. Presented at *6th* Annual Student Neurology and Neurosurgery Research Conference at the Warren Alpert Medical School of Brown University.

[4] **V. Bellala**, D. A. Qureshi, F. D. Abulencia, S. Niu, and V. Srivastava, "Mechanics with machine learning: Applications in flaw and tumor detection," 2023. Presented at *Symposium on Materials and Structures Under Extreme Loading Conditions in honor of Prof. Arun Shukla's 70th birthday*.

[5] **V. Bellala**, T.-W. Lo, S. Nfonoyim-Hara, N. Chia, and Y. Liu, "Toward integrating 3d microstructures in a digital microfluidic platform for enhanced cell capture," 2023. Presented at *2023 Mayo Clinic Graduate School of Biomedical Sciences Summer Student Symposium*.

[6] **V. Bellala**, A. Coyle, and L. Marr, "Meteorological and behavioral correlates of covid-19 transmissibility across the united states," 2022. Presented at *Virginia Tech 2022 Summer Research Symposium*.

Awards and Honors

DuPage County Medical Society Scholarship June 2024
- Awarded a $2000 scholarship for professional education in medicine.

Honors Thesis of Distinction in Biomedical Engineering, Brown University May 2024
- *Development of a Drop Tower to Experimentally Study Moderate Rate Cell Injury* · Advisor: Vikas Srivastava, PhD

Sigma Xi, the Scientific Research Honor Society Apr. 2024

Doris M. and Norman T. Halpin Prize for Innovative and Interdisciplinary Senior Capstone Projects Mar. 2024
- *Redesigning Valves used in Intravenous Lines to Eliminate Dead Volume* · Advisor: Anubhav Tripathi, PhD

Brown University Hazeltine Grants in Engineering (x2) Jan. 2023
- *Redesigning Valves used in Intravenous Lines to Eliminate Dead Volume* · Advisor: Anubhav Tripathi, PhD
- *A personalized, hand-mounted multitool for people with partial upper body paralysis* · Advisor: David Borton, PhD

Brown University School of Engineering Rothberg Catalyzer Fund (x2) Dec. 2023
- *Redesigning Valves used in Intravenous Lines to Eliminate Dead Volume* · Advisor: Anubhav Tripathi, PhD
- *A personalized, hand-mounted multitool for people with partial upper body paralysis* · Advisor: David Borton, PhD

Tau Beta Pi Engineering Honor Society Dec. 2023

Karen T. Romer Undergraduate Teaching and Research Award (UTRA) Jan. - May 2022
- *Experimental study of environmental stress cracking of a semi-crystalline polymer polyethylene* · Advisor: Vikas Srivastava, PhD

Skills & Interests

Technical: R (EpiEstim, tidyverse, ggplot2), Python, MATLAB, Solidworks (CAD), Fusion 360 (CAD), Wolfram Mathematica, LabView, SPICE, Web Development Tools (HTML, CSS, JS, Wordpress)

Laboratory: Cell culture, passaging, and seeding; Hydrogel synthesis; Mechanical (tension and compression) testing; Microscopy; Metalworking; Woodworking; Prototyping

Interests: Film photography, Reading short fiction, 3D printing & modeling, Laser cutting, Open-source technology