

4th Annual Mechanical Engineering Newsletter, Summer 2021

ME Alumni,

Greetings from the ME Department. This past year has seen a lot of activity by our students and faculty, despite the quarantine. Our Spring 2021 undergraduate enrollment was 705 (up from 654 the previous year), and MSME enrollment was 171 (up from 162), with another 42 in our MSME held on-site at Lockheed Martin, so there are always many things going on. Check out some of our news below.

Focus on new faculty



Dr. Ali Tohidi

Education: B.Sc. in Civil Engineering, IAU (Tehran, Iran). M.Sc. in Civil Engineering, Sharif University of Technology (Tehran, Iran), Ph.D. in Civil Engineering, Clemson University, SC, USA.

Date Joined SJSU: Fall 2020

Courses Taught: ME113 Thermodynamics, ME 115 Thermal Engineering Lab

Research: Dr. Tohidi's research and development interests are at the nexus of experimental, data-driven, and mathematical modeling of large-scale systems, particularly the phenomena revolving around fluids and fire. During his M.Sc., he studied the effects of wind-induced surface cooling on transport processes in aquatic canopies. His Ph.D. has been focused on studying wildfire spread mechanisms. He has, also, worked on the combustion-induced thermo-mechanical failure of cellular solids and dynamics of fire whirls. His current efforts are focused on understanding the physics of wildfire spread across different scales and developing new models to better characterize the wildfire risk throughout the landscape.

What he likes about SJSU: Diverse, talented and motivated students, and fellow faculty who are passionate about teaching and dedicated to impactful research.

News Briefs

- Dr. Crystal Han received the 2021 College of Engineering Faculty Award for Excellence in Teaching. Dr. Han has excellent student evaluations and has also run a workshop for engineering faculty about how to actively engage students in online courses. She teaches courses in the thermal-fluids area.
- Joshua Bevis received the 2021 College of Engineering Scott T. Axline Memorial Student Award for Excellence in Service. He served as a tutor for ME 101 Dynamics, and instructor for the ME 120 Experimental Methods lab, and also made presentation to the Board of Trustees about the student experience during the quarantine.

- Dr. Sohail Zaidi received the 2020 College of Engineering Award for Outstanding Lecturer, and Dr. Saeid Bashash won the award for Excellence in Teaching.
- ME senior Ankish Priet was one of only two first place winners for all of the US for the ASME Old Guard Oral Competition in Spring 2020. He also won first place for technical content. His presentation was based on his senior design project, supervised by Prof. James Mokri. ASME advisor and the mentor for this competition was Dr. Winncy Du.
- Dr. Amir Armani was selected as a guest editor of the peer-reviewed journal “Metals”.
- Dr. Vimal Viswanathan has been elected as the program chair for the ASME International Design Engineering Technical Conferences - Design Theory and Methodology (DTM) conference. Dr. Viswanathan will serve in the executive committee of DTM for two years: 2021-2022 as the program chair and 2022-2023 as the division chair.
- Dr. Nicole Okamoto was elected to the ASME Mechanical Engineering Department Heads Committee, effective July 2021.
- Dr. Fred Barez was re-elected to a second term as chair of the Aviation and Technology Department, and Dr. Nicole Okamoto was re-elected to a second term as chair of the Mechanical Engineering Department.
- Two new tenure-track faculty with expertise in medical robotics will be joining the faculty in fall. Dr. Mojtaba Sharifi is coming following a postdoctoral fellowship at University of Alberta, and Dr. Lin Jiang is coming following the recent completion of her PhD at the University of Texas – Dallas.
- A new minor in robotics was approved to start in Fall 2021.
- Dr. Feruza Amirkulova has established our first courses in deep learning. She offered the MS-level course “Deep Learning and Optimization in Engineering” in Fall 2020 for the first time with strong enrollment. That course will be expanded into two for the 21-22 academic year.

SAE Teams Receive Honors

San Jose State University's Formula SAE Electric and Combustion teams competed in online knowledge events under the auspices of SAE International this past spring. The electric team scored 10th out of 50 teams with the combustion team 7th out of 132.

The SJSU teams' industry advisor Harry Quackenboss writes, “Each competition represents a composite score of their performance in design theory and practice of their respective cars, a manufacturing cost analysis, and a realistic business school-style case imagining they were a startup company deciding how most effectively to manufacture and market their car after taking their company public.



Based on the composite score of those events, each team was the highest placing California college in their category.”

Because of their high placement, the Combustion and Electric teams have been invited to compete in in-person competitions in Michigan in July. The teams have

gone through a major reorganization in the past 18 months. While the Combustion category has been the premier category for decades, the students are looking to the future where electrification will be the top

series, following the path of the auto industry. In late 2019, they started putting together a plan to merge their efforts. Phase I involved combining the business operations team, which is responsible for sponsor relations and logistics, sharing component designs, and know-how.

While club meetings were not allowed on campus this year due to the quarantine, the department was able to get permission from the Provost to set up independent study hybrid courses for club members. This allowed them to receive course credit for working on the vehicles and come to campus to work on the builds. The teams followed strict safety protocols, including limitations on room capacity and tracking of who was on campus at what time, in case of COVID exposure.

A number of companies actively recruit engineering and business graduates from the top Formula SAE teams. Many of the students that participated in the three teams (including Baja, a class for off-road vehicles) say the Formula SAE program was a big reason for the offers they got after graduation. They are now working at a number of high-profile companies, such as SpaceX, Tesla, other EV companies including Lucid, Nuro and Rivan, along with other aerospace companies, Lockheed, Raytheon, semiconductor equipment provider, KLA, and medical device manufacturer Stryker. They even have one graduate who chose motorsports career as a race engineer with Corvette Racing, GM's factory team that competes at Daytona, Sebring, and Le Mans.

You can find out more about the teams, including the potential for sponsorships, from their websites:

- Formula Combustion: <http://sjsuformulasae.com/>
- Formula Electric: <http://sr-e.org/>
- Baja: <https://www.sjsubajasae.com/>

Classes During Quarantine

You may be wondering what classes in the ME Department looked like during quarantine. Most lecture courses moved to a “synchronous” instruction mode. For those classes, students logged into Zoom during the regular class day and time. They were able to watch lectures and ask questions, and many instructors would send students into breakout rooms to work on problems during class in small groups. Most faculty used pad computers so they could annotate their lecture notes and work out problems real-time during lectures.

Some faculty used other modes to run their classes. See below for some examples.

- **Dr. Burford Furman, ME 106 Fundamentals of Mechatronics:** ME 106 Fundamentals of Mechatronics ran in 'remote' mode during the Spring 21 semester, where lectures and labs were all handled by Zoom. To pull off the remote labs, the Department assembled over 100 lab 'kits' containing a solderless breadboard, power supply, microcontroller base board, and a handful of components and motors and distributed them to enrolled students. Students met with their lab instructors via Zoom during their lab sessions. Also new last semester was running the course under a mastery framework, where students had to demonstrate (through regular assessments) that they met all of the course learning objectives.
- **Dr. Crystal Han, ME 111 Fluid Mechanics:** Bichronous online courses were newly implemented to enhance student learning in ME111 Fluid Mechanics. In this mode, students watched lecture videos on their own convenient time and participated in a weekly class meeting for active learning where they solved problems as in small groups using breakout rooms. This format of course helped students by building an online learning community and by increasing in-class engagement.
- **Dr. Amir Armani, asynchronous classes:** Asynchronous classes are run without a specified day or time using taped lectures and interactions via Canvas. With asynchronous classes, the students

don't have to worry about missing a class due to illness, work, or technical difficulty; if they get distracted during a lecture, they can pause or replay the lecture video; and if they forget something later, they can go back and watch the lecture again. During the pandemic, courses like ME154, ME157, and ME160 had an asynchronous section.

- **Dr. Vimal Viswanathan, ME 195 A&B Senior Design:** During the Fall 2020-Spring 2021 academic year, the senior design class was offered in a hybrid model. During the first semester (ME 195A), all the seminars, class meetings, and discussions were done virtually. A majority of the team meetings also took place virtually. In the second semester (ME 195B), the seminars and regular class meetings continued to be virtual for most sections. Student teams were allowed to access engineering labs and machine shops for prototyping purposes. Since the capacity of each space in the engineering building was limited, calendars were set up for each space where teams could sign up for its use. The students were also instructed to strictly follow COVID protocols while they were in the labs. The conference day presentations were held virtually with several teams using video conferencing or recorded videos to show their prototypes to the audience. Using the hybrid mode, we were able to provide hands-on experience to most of the student teams.

Seeking Senior Design Project Sponsors

New senior design projects will be starting in August 2021. If you have an idea for a project, please contact Dr. Okamoto (nicole.okamoto@sjsu.edu) or your favorite senior design prof from when you were a student to discuss project sponsorship. Dr. Okamoto has materials describing typical kinds of projects and the process of project sponsorship that could be used to solicit sponsors at your company.

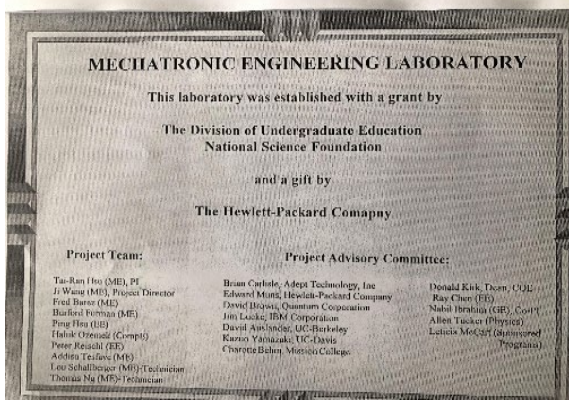
Retirement of Dr. Tai-Ran Hsu



Dr. Tai-Ran Hsu retired in May 2021 after a 31-year tenure at SJSU. He received his PhD in 1968 from McGill University in Montreal. He taught at the University of Manitoba before joining the faculty of SJSU as chair of the department in 1990. He has taught courses such as ME 130 Applied Engineering Analysis, ME 160 Finite Element Analysis, ME 189 Design and Manufacture of Microsystems, and ME 195a/b Senior Design Project I and II, among others.

One of his premier accomplishments as chair of the department was the establishment of our mechatronics curriculum. Dr. Hsu put together an Industrial Advisory Committee with memberships from IBM, HP, Adept Technology, Inc., Hewlett-Packard, and Quantum Corporation and solicited a large equipment donation from Hewlett-Packard. In 1995 he also solicited and received a major grant from the National Science Foundation to start the new program. This was the first grant from the National Science Foundation to support the development of an undergraduate curriculum in mechatronics. He writes of his aspiration for our students:

“I wanted to make them “excellent mechanical engineers” who are current with the fast-advancing technologies and are major contributors to the prosperity of the State of California. I would also like to see that each of our BS graduates would receive at least two excellent job offers by local business and industries six months before their graduations. I had my last dream because I believe our graduates’



employment opportunities are the best “endorsements” on what we do with the education we provide to our students in an institution that the community supports.

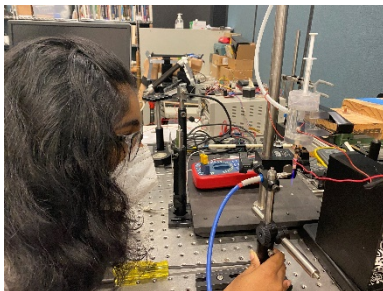
Of course, I was not naive to think that the way to realize all my dreams would be smooth and easy. I figured the only way we may fulfill all these goals is to be sure that the education that we offer to our students would not only be unique but it will also be closely relevant to the needs of the Silicon Valley business and industries. Consequently, I developed the idea of introducing Mechatronics engineering into our department educational program.”

Dr. Hsu has been a prolific writer during his career. In addition to numerous journal articles and conference proceedings, Dr. Hsu is the author of a number of textbooks, including “MEMS and Microsystems: Design, Manufacture, and Nanoscale Engineering”, “The Finite Element Method in Thermomechanics,” “Computer-Aided Design: An Integrated Approach,” and most recently, “Applied Engineering Analysis.”

Dr. Hsu, we will miss you and wish you the best in your well-deserved retirement!

Princeton Collaborative Research on Low-Temperature Plasma (PCRF) Project

Dr. Sohail Zaidi has launched a collaborative research program on low-temperature plasmas with Princeton University (PCRF- lab). Two students, Haadi Ilahi from the Mechanical Engineering Department and Bhavya Bellannagari from IntelliScience Research Labs, were selected for this research. Both students will be completing a three-week research program at Princeton. The research will look at the DBD plasma jet devices designed by Dr. Zaidi and are currently being characterized at IntelliScience labs by SJSU students. This plasma device needs complete characterization at various plasma operating conditions to optimize its performance. The role of radical species in the rapid healing and sterilization process will be explored. In the proposed experiments, hybrid CARS (femtosecond/picosecond CARS) thermometry will be employed to probe rotational and vibrational temperatures in the plasma jet at various operating conditions. The temperatures will be measured both along and across the plasma jet. This plasma temperature information will be correlated with NO concentration measured using the laser-induced fluorescence (LIF) technique, where the laser will be tuned to 226 nm. Measurements of plasma rotational and vibrational temperatures correlated with NO concentration as a function of various plasma operating conditions will provide a parametric study on plasma and its impact on wounds.



This work will be conducted under the supervision of Dr. Arthur Dogariu at PCRF Princeton labs. In addition, industry-sponsored research at the IntelliScience lab facility allowed both graduate and undergraduate SJSU students to complete their research projects successfully in 2021. Six undergraduate and three graduate groups conducted research in various fields, including energy conservation, thermal management in batteries, assistive knee-brace, 3D printing, thermal management in high-power LED panels, plasma wound healing and sterilization, and robotics automation. IntelliScience, along with Hastest Solutions (Bay-area-based company internationally known for the environmental testing chambers), provided funds for various research projects. IntelliScience is providing a unique platform to high school seniors to conduct STEM-based research with SJSU research groups, exposing high school students to advanced research programs before they join college to pursue their academic goals. This activity is flourishing, and in 2021, seven research presentations were made at NCUR (National Conferences on Undergraduate Research) by SJSU students. SJSU students, along with IntelliScience researchers, participated in the Bay-Area Biomedical Conference, where two research posters were presented. New collaborative work at IntelliScience and the department of mechanical engineering at SJSU will continue in the coming years.

Research Spotlight: Wildfire Interdisciplinary Research Center Grants

Dr. Ali Tohidi and co-PI's from SJSU's Wildfire Interdisciplinary Research Center have begun work on two funded grants.

The first, funded by the National Science Foundation, is entitled, "*Biomass burning smoke as a driver of multi-scale microbial teleconnections.*" The ways that microbes are transported from one environment to another are not well understood. Each year, wildland fires emit millions of tons of smoke particles into the atmosphere and these particles likely carry microbes. The overarching hypothesis of this study is that plant and soil microorganisms mobilized by fire to the atmosphere survive conditions associated with atmospheric transport, immigrate to new environments, and influence the composition and function of the ecosystems where they are deposited. The cross-disciplinary team has combined expertise in microbiology, fire science, soil ecology, and atmospheric modeling to establish a new methodology for testing these impacts. These studies will be coupled with laboratory combustion experiments and soil incubations that mimic conditions in nature.



Active fire line during the SCU Lightning Complex incident near Corral Hollow Road in San Joaquin County between Tracy and Livermore, California, on Tuesday, Aug. 18, 2020. The source is SFGATE, available via <https://bit.ly/3ePmu4E>

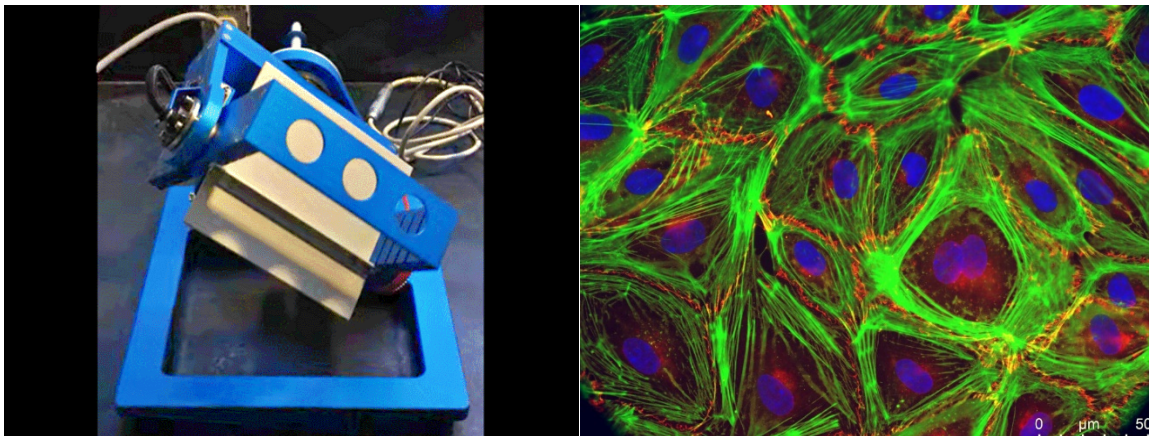
The second grant, funded by IBM, is entitled, "*Inverse Solver for Real-Time Operational Wildfire Forecast.*" This project aims to develop an inverse solver for real-time operational wildfire forecasts using high-fidelity observational data. In the short term, this project will lead to accurate estimation of the fire rate of spread and development of a state-of-the-art data-driven operational wildfire model. In the long-term, the data-driven approach will lead us to find the proper spatiotemporal scales through which wildfire behavior can be explored and modeled more accurately.

Research Spotlight: Thrombosis in Microgravity

In order to understand critical risks associated with thrombotic complications during space missions, Professor John Lee has teamed with Prof. Anand Ramasubramanian (Principal Investigator, Chemical and Materials Engineering) and Prof. Wendy Lee (Computer Science) on a research investigation of thrombosis (i.e., blood clotting) in microgravity. The \$150k grant was awarded to the SJSU team by the NASA Space Biology Program [<https://science.nasa.gov/biological-physical/programs/space-biology>] to provide new insights into the poorly understood yet vitally important aspects of how spaceflight affects the vasculature and thrombosis.

The project involves perfused cell culture experiments on an endothelialized microfluidic model of the vasculature. Experiments are conducted on a random positioning machine (shown below left) that simulates microgravity by time-averaged elimination of preferred orientation. Fluorescence microscopy of endothelial cells (shown below right), image analysis, and RNA sequencing, and transcriptomic analysis are used to determine how endothelial cell morphology and gene expression are altered by the absence of normal gravity.

The project brings together faculty expertise across vascular mechanobiology, microfluidics, and systems biology, and has engaged students spanning the disciplines of mechanical engineering, biomedical engineering, chemical engineering, computer science, and electrical engineering.



2020-2021 Peer-Reviewed Publications

*=SJSU student author; ME faculty author in bold

Y. Li, G. Blois, **F. Kazemifar** and K. Christensen, “A Particle-Based Image Segmentation Method for Phase Separation and Interface Detection in PIV Images of Multiphase Flow in Porous Media” *Measurements Science and Technology*, (2021)

F. Kazemifar, G. Blois, M. Aybar, P. Perez Calleja, R. Nerenberg, S. Sinha, R. Hardy, J. L. Best, G. Sambrook Smith and K. Christensen, “The effect of biofilm on turbulent flow over permeable beds” *Water Resources Research* 57 (2021) e2019WR026032.

S. Bashash, “Extended horizon ECMS control of PHEVs with 2D electricity price adaptation policy”, *IEEE Transactions on Intelligent Transportation Systems* (Available online, Dec. 2020).

A. Ly and **S. Bashash**, “Fast transactive control for frequency regulation in smart grids with demand response and energy storage”, *Energies*, 13, 4771, 2020.

I.I. Tyukhov, N.P. Klochko, V.A. Barbash, K.S. Klepikova, and V.R. Kopach, Biodegradable flexible transparent films with copper iodide and biomass-derived nanocellulose for ultraviolet and high-energy visible light protection, *Solar Energy*, v. 220, 2021, p. 852-863.

I.I. Tyukhov N.P., Klochko, V.A. Barbash, K.S. Klepikova, and V.R. Kopach, Efficient biodegradable flexible hydrophobic thermoelectric material based on biomass-derived nanocellulose film and copper iodide thin nanostructured layer *Solar Energy*, 212 (2020) 231–240.

I. I. Tyukhov A. V. Stanchik, and M. S. Tivanov, Temperature dependence of Raman scattering in the Cu₂ZnSnSe₄ thin films on a Ta foil substrate, *Solar Energy*, 2020, v.201, p. 480-488.

Chu, E.* , **Okamoto, N.**, and **Zaidi, S.**, 2021, “Start-Up Power Requirements for an Axial Grooved Thermosyphon,” 5-6th Thermal and Fluids Engineering Conference.

Sullivan-Green, L., Parent, D., **Okamoto, N.**, and Backer, P., 2021, “Integrating Environmental Justice and Globalization into Senior Capstone Courses in Mechanical Engineering”, *Frontiers in Education Conference*.

Tyukhov, I., Okamoto, N., Semahegn, S.* , and Sanchez, J.* , 2021, “Integrating Photovoltaics to Thermal Engineering Lab,” 5th International Conference on Fossil and Renewable Energy.

Huang, G* , **Okamoto, N.**, and **Kazemifar, F.**, 2021, “Numerical Investigation of Thermal Spreading Resistance of Vapor Chambers,” *Proceedings of Semi-Therm 36*, San Jose, CA.

Okamoto, N., 2020, “Implementation of Competency-Based Learning Assessment in an Undergraduate Thermodynamics Course,” *ASEE Annual Conference Proceedings*.

Mokri, J., Okamoto, N., and Neagu, S., 2020, “Implementation of a Near-Peer Mentoring Program between a High-School Technology Class and a University Undergraduate Engineering Class,” *ASEE Annual Conference Proceedings*.

Drake, E.* , **Okamoto, N.**, and **Thurlow, E.**, 2020, “The Use of CFD to Analyze and Predict the Pressure Drop Along Flat Oval Duct Fittings,” *ASHRAE Transactions*, Vol. 126, No. 2, pp. 493-500.

Tran, M.* , **Okamoto, N., Kabbani, H., and Bashash, S.**, 2020, “Determination of Cost Savings Using Variable Speed Fans for Cooling Servers,” *Proceedings of Semi-Therm 36*, San Jose, CA.

Shah, T.* , Zhuo, L., Lai, P., Rosa-Moreno, A., **Amirkulova, F.**, and Gerstoft, P. “Reinforcement learning applied to metamaterial design”. *The Journal of the Acoustical Society of America*, Special Issue on “Machine learning in Acoustics” (accepted June 17 2021, Manuscript No.: JASA-06781)

Amirkulova, F., Gerges, S., Norris, A.N., 2020 “Broadband acoustic lens design using the principle of reciprocity and gradient-based optimization”. *The Journal of the Acoustical Society of America* 148 (4), 2605-2605.

Amirkulova, F., Lai, P.* Design of Acoustic Metaclusters for the Sound Control. Paper#NC20_576, *Proceedings of conference Noise-Con 2020*, 7-pages. Online presentation.
<https://www.inceusa.org/noisecon20/program/schedule/>

Lai, P. *, **Amirkulova, F.**, Attiogbe, M. * "Control of acoustic waves using finite acoustic metaclusters", Proc. SPIE 11460, Metamaterials, Metadevices, and Metasystems 2020, 114602O; Event: SPIE Nanoscience + Engineering, August 2020, <https://doi.org/10.1117/12.2568327> (online poster).

Tran T. *, Lai P. *, Rosa, A. D. L., **F. Amirkulova**, E. Khatami. Convolutional Neural Network Representation of the Total Multiple Scattering Cross Section. ASME IMECE (online presentation), November 16 2020. <https://imece.secure-platform.com/a/solicitations/121/sessiongallery/5695/application/57881>.

Amirkulova, F., Gerges, S., Norris, A.N., 2020, "Broadband Uni- and Multi-Directional Acoustic Lens Design Using Gradient-Based Optimization", ASME IMECE2020 (online presentation) November 16 2020. <https://imece.secure-platform.com/a/solicitations/121/sessiongallery/5695/application/55531>

Tristan Shah* and **F. Amirkulova**. "Broadband Suppression of Total Cross Sectional Scattering Using Deep Reinforcement Learning". Poster presentation, online MLSE conference, Dec 14-15 2020. <https://www.mlse2020.com/posters/engineering-7>

Lai, P. *, **Amirkulova F.** "Inverse Design of Acoustic Metamaterials Using Generative Neural Networks". Poster presentation, online MLSE conference, Dec 14-15 2020. <https://www.mlse2020.com/posters/engineering-6>

Nayak, P. *, **Armani, A.**, 2021, "Optimal 3D Design of Functionally Graded Parts for Additive Manufacturing Using Tamura-Tomato-Ozawa Model," Journal of Materials: Design and Applications (In Press).

Tupac-Yupanqui, H. *, **Armani, A.**, 2021 "Additive Manufacturing of Functional Inconel 718 Parts from Recycled Materials," Journal of Materials Engineering and Performance 30, pp. 1177-1187.

Li, W., **Armani, A.**, Martin, A., Kroehler, B., Henderson, A., Huang, T., Watts, J., Hilmas, G., Leu, M., 2021, "Extrusion-based Additive Manufacturing of Functionally Graded Ceramics," Journal of the European Ceramic Society 41, pp. 2049-2057.

Ahuri, T., **Armani, A.**, Hamidi, R., Reasnor, T., Ahmadi, S., Iqbal K., 2020, "Biomedical Soft Robots: Current Status and Perspective," Biomedical Engineering Letters 10, pp. 369–385.

Li, W., **Armani, A.**, McMillen, D., Leu, M., Hilmas, G., Watts, J., 2020, "Additive Manufacturing of Zirconia Parts with Organic Sacrificial Supports," International Journal of Applied Ceramic Technology 17, pp. 1544-1553.

Bose*, A., and **Viswanathan, V.**, 2021, "Mitigating the Piston Effect in High-speed Hyperloop Transportation: A Study on the Use of Aerofoils," Energies Special Issue on Hyperloop and Associated Technologies, 14 (2), pp. 464, DOI: 10.3390/en14020464.

Viswanathan. V., and Linsey, J., 2020, "Designing with Examples: A Study on the Role of Familiarity, Warnings and Physical Modeling," Journal of Engineering Design, 31 (11-12), pp. 552-573, DOI: 10.1080/09544828.2020.1851356.

Solomon, J., Hamilton, E., **Viswanathan, V.**, and Nayak, C., 2020, "A PROTOCOL Based Blended Model for Fluid Mechanics Instruction," Journal of STEM Education, 21 (3), pp. 19-27, available at <https://www.jstem.org/jstem/index.php/JSTEM/article/view/2417/2181>

Mathur, V. and **Yee, R.**, 2020. "Design and Analysis of a Drone Mechanism with 3-axis of Rotation," Proceedings of the ASME 2020 International Mechanical Engineering Congress & Exposition, Virtual Conference, Nov 16-19, 2020.

Elahi*, H., Parez*, M., **Viswanathan, V.**, Vemuri, A., Madireddy, I., and **Zaidi, S.**, 2021, "Characterization and Optimization of a Lower Extremity Exoskeleton Device for Leg Muscle Rehabilitation," ASME International Mechanical Engineering Congress and Exposition (IMECE), virtual conference.

Near*, E., Ihsan*, M., Chan*, W., and **Viswanathan, V.**, 2021, "Design and Testing of a Low-cost Ventilator to Battle the Global Pandemic," ASME International Mechanical Engineering Congress and Exposition (IMECE), virtual conference.

Runyon, M., **Viswanathan, V.**, Talley, K., Hammond, T., and Linsey, J., 2021, "Mechanix: An Intelligent Web Interface for Automatic Grading of Sketched Free Body Diagrams," ASEE Annual Conference, virtual conference.

Mokadam*, A., Shivakumar*, S., **Viswanathan, V.**, and Agumbe-Suresh, M., 2021, "Online Product Review Analysis to Automate the Extraction of Customer Requirements," ASME International Design Engineering Technical Conferences (IDETC) – Design Theory & Methodology (DTM), virtual conference.

Patel*, H., Chung*, W. K., **Viswanathan, V.**, and Zaidi, S., 2020, "Design and Testing of a Physical Therapy Device Controlled by Voice Commands," ASME's International Mechanical Engineering Congress and Exposition (IMECE 2020), Portland, OR (online).

Elahi*, H., Madireddy*, I., Vemuri*, A., Cabral*, E., **Zaidi, S., and Viswanathan, V.**, 2021, "Characterization of EMG Sensors and Fluidic Muscles for Developing a Bioleg Knee Brace," National Conference on Undergraduate Research (NCUR) (poster).

Zhu*, R., Perez*, M., Bellannagari*, P., **Zaidi, S., and Viswanathan, V.**, 2021, "Design Analysis for a Voice Activated Robotic Bioleg Knee Brace," National Conference on Undergraduate Research (poster).

Pham*, H., Bellannagari*, P., Zaidi, S., and **Viswanathan, V.**, 2021, "Design and Development of an Exercise Bike Power Generator," National Conference on Undergraduate Research (NCUR) (poster).

N. McCarthy, **A Tohidi**, Y. Aziz, M. Dennie, M. Valero, and N. Hu, "A deep learning approach to downscale geostationary satellite imagery for decision support in high impact wildfires", *Forests* (March-2021), DOI:10.3390/f12030294

A. Tohidi, "Numerical modeling of debris flight in a one-cell tornado wind field", 6th American Association for Wind Engineering Workshop; Clemson University, Clemson, South Carolina, USA. (May- 2021).

S.J. Lee, D.M. Nguyen*, H.S. Grewal*, C. Puligundla, A.K. Saha, P.M. Nair, A.P. Cap and A.K. Ramasubramanian*, "Image-based analysis and simulation of the effect of platelet storage temperature on clot mechanics under uniaxial strain," *Biomechanics and Modeling in Mechanobiology*, vol. 19, pp. 173-187, 2020.

Furman, B., Ahsan, S., Wertz, E., "Making the Move from C to Python With Mechanical Engineering Students", ASEE Virtual Conference, June 22 – 26, 2020. (available at: <https://peer.asee.org/making-the-move-from-c-to-python-with-mechanical-engineering-students.pdf>)