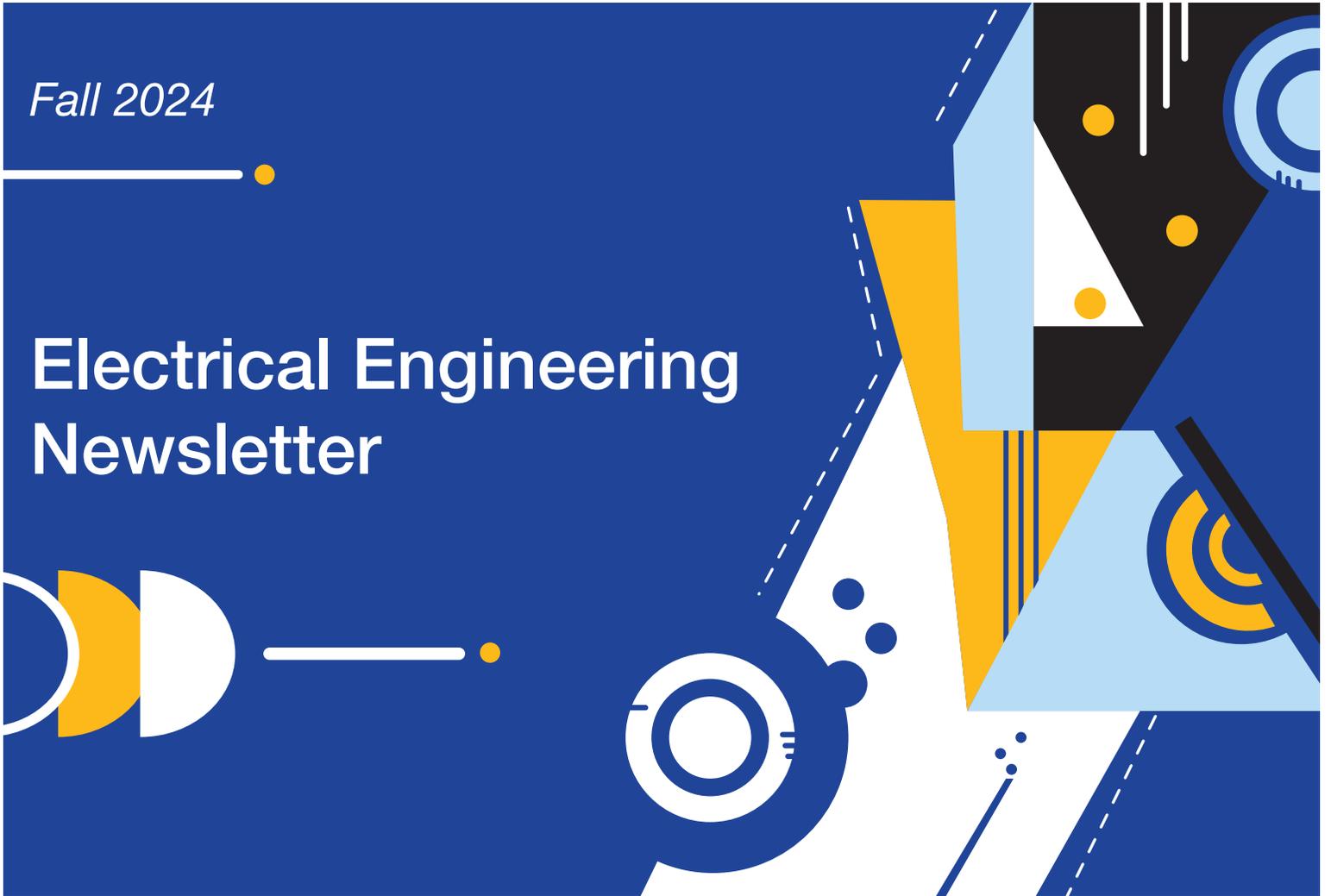


SJSU

CHARLES W. DAVIDSON  
COLLEGE OF ENGINEERING

Fall 2024

Electrical Engineering  
Newsletter

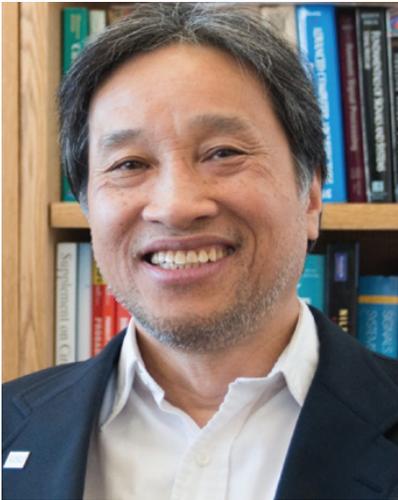


# A Message from the Department Chair

Dr. Thuy Le 



## Dr. Thuy Le, Department Chair & Professor



It's hard to believe that the Fall 2024 semester is already upon us. Are you rested and recharged after taking the summer off? I hope everyone got a chance to relax, travel, or just spend some time with family and friends. A lot has happened since the last time we shared with you. Last December, we saw the return of the Department's annual holiday banquet.

Approximately 40 faculty, retirees and their spouses attended the event at China Stix Restaurant in Santa Clara. It was a wonderful time to catch up with old friends and to celebrate the completion of the fall semester.

Our group also celebrated a very successful ABET audit. The Accreditation Board for Engineers and Technology reviews our program in detail every six years. We are proud to report that Electrical Engineering was the only engineering department without any concerns or weaknesses. In May of this year, we had our annual alumni reunion.

Holding the event on the same date as our Student Symposium allowed our alumni to enjoy seeing all of the projects of our current students. Attendees were treated to lunch and many fun Spartan door prizes. Lots of hugs, photos and trading of contact information went on throughout the afternoon.

Starting the fall semester is always a pleasure. We get to welcome a large group of new students as well as the returning ones. For faculty, we gather as a group and begin our plans for the semester. We've already faced our share of challenges. Several storms last winter pounded the campus and the bay area. A one-week faculty strike threatened to disrupt the start of the spring semester, but was quickly resolved when the Union and the University reached an agreement. On top of that, State budget concerns have caused a tightening of the Electrical Engineering Department's budget. This continues to be a major challenge for the department, as well as the University

However, our amazing group of professors, lecturers, staff and student employees have met every challenge. For us, it's just business as usual. And as usual, the EE calendar is marked with events. Oral presentations for senior capstone projects are scheduled for Friday December 6. Our Student Project Symposium will showcase the projects of dozens of graduate and undergraduate student groups. You can catch the Symposium this semester on Monday December 9, in the Student Union ballroom. In addition, I have all sorts of exciting department news to share with you. Faculty promotions, grant awards, student club info, scholarships and new course information. So, before we all get too busy, take a few moments and enjoy our annual newsletter.

# Exciting Research by Professor Jadhav

Dr. Shrikant Jadhav

## Dr. Shrikant Jadhav, Assistant Professor



An HPC Platform for Real-Time Environment Monitoring Using Machine Learning. This research project has been funded by the Department of Energy from February 2024 to February 2025. The DoE awarded \$350K for our research to develop a real-time machine learning (RTML), have emerged as a breakthrough in diverse fields like robotics, autonomous vehicles, healthcare systems, finance, etc. It is a powerful platform that could be used for real-time environmental monitoring. By regularly analyzing data from various sensors and devices, RTML will aid us in identifying anomalies and patterns that could signify potential environmental issues. It will allow us to quickly process and analyze large amounts of data and make informed decisions based on real-time insights. RTML for environment monitoring requires a robust data acquisition, processing, and model deployment infrastructure. High-performance computing, efficient data storage, and scalable processing capabilities are essential components to support RTML.

Additionally, ongoing monitoring, maintenance, and validation are crucial to ensure the accuracy and reliability of the machine-learning models used for environmental monitoring. This project aims to develop a methodology for effective online training of cutting-edge machine learning algorithms used for environmental monitoring. The training model will be able to actively understand and learn from the current data, enhance the performance using what the model has learned, and adapt to dynamic surroundings in real-time. In this project, we plan to develop and implement a practical training framework for RTML at the algorithm level, with trained models inherently efficient for inference. The framework will process the real-time data from the underground IoT device for making predictions while learning from the previous data.

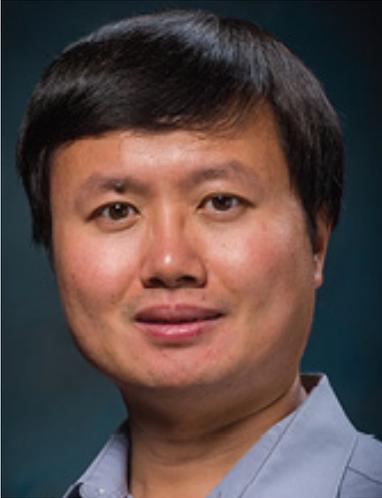
The proposed framework will provide an adaptive model capable of evaluating groundwater monitoring data to optimize long-term monitoring strategies. We will also study the dynamics of the data rate required to enable a real-time decision making system for environmental monitoring. Modern ML techniques require a massive amount of labeled data for training purposes. We plan to develop and integrate a tool for automated labeling and structuring real-time data received from the underground IoT device. To enhance the efficiency of the RTML framework, we will also make efforts to continuously adapt and specialize the environment monitoring model as the data received may change over time. We also plan to devise a hardware architecture to provide flexibility and support for real-time model training and inference. This project will help create new and opensource learning materials that can attract diverse students and eventually provide a platform for diversity and innovation.

# Awarded Grants for Electrical Engineering

Dr. Hiu-Yung Wong



## Dr. Hiu-Yung Wong, Associate Professor



Since the Spring of 2021, Hiu-Yung Wong has obtained several large grants for our department. They include:

Samsung Inc, Cryogenic MOSFET Mobility Extraction and Modeling, US \$75K, (2023-2024).

Atomera Inc, Cryogenic Characterization and Modelling of MST Devices and Analog Circuits. US \$50,052 (2022-2023).

Augmented with TCAD-enabled Machine Learning, US \$100k (2024-2025).

Atomera Inc, Circuit Simulation, Carrier Transport Physics Characterization, and BTI Reliability Modeling of MST, US \$66K (2021-2022).

National Science Foundation, CAREER: Understanding and Modeling of Cryogenic Semiconductor Device Physics down to 4.2K, US\$500K, (2021-2026).

National Science Foundation, FMSG: Cyber: Cyber manufacturing of WideBandgap Semiconductor Devices Enabled by Simulation Augmented Machine Learning, US \$500K, (2021- 2023).

Dr. Wong is the Co-PI and received \$200K to perform TCAD and Machine Learning research. National Science Foundation, Collaborative Research: NRT-QL: A Program for Training a Quantum Workforce, US\$739K (2021-2026). Dr. Wong is one of the Co-PI. Applied Materials Inc, Power Device Simulation and Optimization, US \$65K,(2021-2022).

# Awarded Grants for Electrical Engineering

Dr. Chang "Charles" Choo ——— ◡

## Dr. Chang "Charles" Choo, Professor

Charles Choo has also been busy generating money for Electrical Engineering research. His grants include a \$20,000 grant from MegaChips Corporation. MegaChips is a global semiconductor company, headquartered in Osaka, Japan.

This funding was provided for performance evaluation of edge AI boards for various CNN and RNN models and development of corresponding training materials. Additionally, \$40,000 was awarded to the Electrical Engineering Department from the Electronics and Telecommunications Research Institute of South Korea. ETRI is a Korean government-funded research institution.

This grant was awarded for development of Albased resource allocation schemes for self-organizing network (SON) in ultra-dense small cell systems.



# Project Engineering Success

Dr. David Parent ——— ▲



## Dr. David Parent, Professor & Undergrad Advisor

San Jose State University has received a five-year, five-million dollar grant from the Department of Education to increase the retention and graduation rates of Hispanic and low-income students earning degrees in engineering and computer science.

Partnering with San Jose City College and Gavilan Community College, SJSU aims to work collectively to increase the number of Hispanic and low-income students attaining degrees in the fields of science, technology, engineering, and math (STEM) through research opportunities, internships, outreach programs, transfer pathways, and faculty workshops. The project team includes Electrical Engineering's David Parent. David is a co-PI and Project Coordinator on this high-profile endeavor.

# Visiting Scholar Returns to SJSU Campus

Abhishek Raol & Dr. Jae-Heung Kim

## Abhishek Raol, Atomera Inc.



Abhishek Raol is a staff engineer at Atomera Inc., a prominent semiconductor materials and intellectual property licensing company based in Los Gatos, California, and an esteemed industry partner of San Jose State University's College of Engineering. Previously, Abhishek was a graduate student at San Jose State University, where he contributed to research projects at the Multi-Physics and Circuit (M-PAC) laboratory under the guidance of Professor Hiu-Yung Wong.

Abhishek successfully completed his master's thesis on the optimization of Ferroelectric nanowires, to achieve a Sub- 60mV/decade sub-threshold slope. His work in the M-PAC lab, coupled with the knowledge gained from Professor Wong's Advanced Semiconductor course, ignited his passion for the Semiconductor industry.

As a visiting scholar over the last few years, Abhishek collaborates with the M-PAC lab, engaging in circuit simulations and adjusting compact model parameters. His efforts aim to promote innovative methods of Design Technology Co-optimization.

## Dr. Jae-Heung Kim, ETRI

The Department is also hosting a visiting scholar, Dr. Jae-Heung Kim from the Electronics and Telecommunications Research Institute (ETRI) of South Korea. Dr. Kim, a Principal Research Staff member at ETRI, arrived at SJSU in September 2023. He conducts research on application of AI and Machine Learning for 5G+/6G mobile communication systems, access control, and resources management. Welcome!



# New Lecturers

*Dr. Rakesh Jeyasingh, Dr. Murat Okyar*

## Dr. Rakesh Jeyasingh



Dr. Rakesh Jeyasingh joined the EE Department in the Fall 2023 semester. He received his Ph.D. from Stanford University, his MS from the Indian Institute of Science, Bangalore and a BE degree from the College of Engineering Guindy, Chennai.

He is currently working full time at Intel as a Senior Memory Integration Engineer in the Intel Data Center and AI group. He has taught EE124, and is currently teaching EE 128 this fall. His areas of expertise include memory devices, fundamental device physics and circuit design. In his free time, he enjoys hiking and traveling with his family and friends.

## Dr. Murat Okyar

Dr. Murat Okyar joined the EE adjunct faculty in the Spring of 2024. However, he's not new to San Jose State as he's taught in the College of Business since the Fall 2021 semester. In addition to his part-time role here at SJSU, he has worked the last 13 years at Maxim Integrated/Analog Devices, and is currently the Director of Mixed Signal Design Engineering. Dr. Okyar earned his BS and MS in Electrical Engineering from Istanbul Technical University, Turkey, and completed his Ph.D. in Electrical Engineering at the New Jersey Institute of Technology. He also earned an MBA here at San Jose State.

Additional comments from Dr. Okyar: "I find immense satisfaction in teaching and mentoring students, interns and junior engineers because it allows me to share my knowledge and experience with them, contribute to their growth, and see them succeed in their careers. It is very rewarding to be a part of their journey and help them reach their full potential as much as I can. In my spare time I like immersing myself in nature by going for hikes in the nearby parks and open spaces. Being outdoors is rejuvenating and helps me unwind and recharge".



# New Lecturers

*Dr. Yazdan P. Razi, Dr. Harish Hiriannaiah*

## Dr. Yazdan P. Razi



Dr. Yazdan P. Razi also joins the EE Department for Fall 2024. While new to Electrical Engineering, Dr. Razi has worked at San Jose State since 2017. He's taught in AE, ME, CHE, Math and CE. He comes to us with a wealth of knowledge, having over 16 years of experience in Silicon Valley and having authored over 46 research papers. He teaches EE225 in the fall. Welcome!

## Dr. Harish Hiriannaiah

Dr. Harish Hiriannaiah is the CTO of Wyzent Technologies, a technology consulting firm. He has worked for over 35 years in various aspects of Signal and Imaging sciences and technologies. He did his graduate and doctorate studies at North Carolina State University, conducting research in optimization methods in Signal Analysis. He has worked in various modalities-Visible band and UV imaging, IR imaging, SEM, X-ray, CT, PET, Ultrasound and Radiation Therapy.

He has worked in pattern / object detection and classification technologies and Computer/Machine Vision. The work has involved mathematical modeling, signal/data acquisition, algorithm development and implementation, embedded and high-performance computing and systems engineering.

Dr. Hiriannaiah is also working as an adjunct faculty at Santa Clara University in Electrical Engineering, teaching and mentoring students at the undergraduate and graduate levels. Professor Hiriannaiah joins us for the fall 2024 semester. Welcome, Dr. Hiriannaiah.



# Department Advisory Committee Appoints New Chair

Rufino Olay III



## Rufino Olay III



The Electrical Engineering Department Advisory Committee (DAC) is an independent body that advises and supports our faculty. The committee ensures courses remain relevant to practicing electrical engineers, provides strategic guidance on our department's educational objectives and missions, updates faculty and students with information on industry practices, and assists the department's effort in providing scholarships for students and graduates' placement.

The support of our committee members and the connection between industry and education is critical to the effectiveness of the EE Department. Through continual development and improvement of the program's curriculum, the DAC is helping our department achieve its mission of educating the next generation of world-class engineers.

The Committee welcomes its newest member, Rufino Olay III, who will also serve as the DAC Chair for the 2024-25 school year. Rufino is a '94 SJSU EE graduate who also earned an MBA degree from Saint Mary's College. He has spent the last 30 years in Silicon Valley and Asia at numerous companies and for the last decade has been in the startup community. His last venture was as COO and Co-Founder of Bolt Graphics, a funded startup developing scalable Ray Tracing accelerated graphics solutions for the cinema and mobile markets. Rufino has also served as a Chairman of the IEEE Santa Clara Valley Executive Committee and other executive roles at non-profit organizations. Welcome, Rufino!

# IEEE News



Congratulations to the newest Institute of Electrical and Electronics Engineers (IEEE) club officers.

President: Umama Oishi

Vice President: Dhruv Varshney

Secretary: Diego Ventura

Treasurer: Vineeth Kandukuri

Event Coordinator: Sehtej Khehra

Event Coordinator: Sidhnat Sadawarti

Project Lead: Atiksh Rao

Marketing Officer: Srishti Sinha

General Officer: Edric Ong

General Officer: Benjamin Le

General Officer: Connie Ly

General Officer: Sahithya Swaminathan

General Officer: Tsairong Chih

For those of you who may not know, IEEE is the world's largest association of technical professionals. It was formed in 1963 and has membership in countries all over the world. Here at San Jose State University, our Electrical Engineering Department has a student-led branch that is the most active in the Bay Area. Something else you may not know is that the SJSU branch is open to engineering students of any discipline. Their large clubroom in ENG376 is a place where students can work on projects, study, or just socialize. The club offers free equipment rental to its members. They also offer locker rentals and free printing. In addition, IEEE hosts events throughout the school year. It is a great way to network with industry professionals and with other engineering students. You can follow IEEE on Facebook and Instagram for information on upcoming events. For more info, contact the club at [ieee@sjsu.edu](mailto:ieee@sjsu.edu)

# Awarded Scholarships



The Electrical Engineering Department administers a pair of student scholarship programs. The Clifford Smith Endowed Scholarship and the Broadcom Scholarship both offer awards to some of our hardest working Electrical Engineering students. Our two Broadcom Scholarship \$5,000 awardees are:

Pranoti Phutane  
Roshni Dhandamudi

Our four Clifford Smith Endowed Scholarship \$2,500 awardees are:

Emily Lin  
Peter Al Asseily  
Sofia Argentina Fiallos  
Eloisa Kaye Difuntorum

Congratulations to all our winners!



# EE Faculty and Staff



**Chang Choo,**  
Professor  
Ph.D., Rensselaer Polytechnic Institute

**Sotoudeh Hamed-Hagh,**  
Professor  
Ph.D., University of Toronto

**Lili He,**  
Professor & Graduate Advisor  
Ph.D., State University of New York

**Ping Hsu,**  
Professor  
Ph.D., University of California, Berkeley

**Shrikant Jadhav,**  
Assistant Professor  
Ph.D., North Carolina A&T State University

**Thuy T. Le,**  
Professor & Department Chair  
Ph.D., University of California, Berkeley

**Essam Marouf,**  
Professor  
Ph.D., Stanford University

**Nader F. Mir,**  
Professor  
Ph.D., Washington University

**Robert H. Morelos-Zaragoza,**  
Professor & Major Advisor  
Ph.D., University of Hawaii

**David W. Parent,**  
Professor & Major Advisor  
Ph.D., University of Connecticut

**Birsen Sirkeci,**  
Professor & Graduate Coordinator  
Ph.D., Cornell University

**Belle Wei,**  
Professor  
Ph.D., University of California, Berkeley

**Hiu-Yung Wong,**  
Associate Professor & Graduate Advisor  
Ph.D., University of California, Berkeley

**Juzi Zhao,**  
Assistant Professor  
Ph.D., George Washington University

**Eveline Bellegarda,**  
Lecturer  
Ph.D., University of Rochester

**Khosrow Ghadiri,**  
Lecturer  
Ph.D., International Technological University

**Bhawandeep Singh Harsh,**  
Lecturer  
MSEE, San Jose State University

**Harish Hiriyannaiah,**  
Lecturer  
Ph.D., North Carolina State University

**Rakesh Jeyasingh,**  
Lecturer  
Ph.D., Stanford University

**Morris Jones,**  
Lecturer  
MSEE, Brigham Young University

**JeongHee Kim,**  
Lecturer  
Ph.D., New Mexico State University

**Ray Kwok,**  
Lecturer  
Ph.D., University of California, Los Angeles

**Binh Q. Le,**  
Lecturer  
Ph.D., Stanford University

**Sang-Soo Lee,**  
Lecturer  
Ph.D., Carnegie Mellon University

**Tan V. Nguyen,**  
Lecturer  
Dr. Eng., Santa Clara University

**Murat Okyar,**  
Lecturer  
Ph.D., New Jersey Institute of Technology

**Yazdan Pedram Razi,**  
Lecturer  
Ph.D., Sharif University of Technology, Iran

**Christopher Pham,**  
Lecturer  
MSEE, San Jose State University

**Jalel Rejeb,**  
Lecturer  
Ph.D., Syracuse University

**Chao-Li Tarng,**  
Lecturer  
Ph.D., University of Washington

**Igor Tyukhov,**  
Lecturer  
Ph.D., Moscow Power Engineering Institute

**Tom Wrappe,**  
Lecturer  
MBA, University of Chicago

**Bradley Carrell,**  
Department Analyst

**Roopa Gadham,**  
Department Coordinator

**Manvir Bath,**  
Systems Analyst



# Department Advisory Committee



**Mr. Rufino Olay III**

Committee Chair  
Entrepreneur,  
Former COO & CoFounder of Bolt Graphics

**Dr. Utku Diril**

ASIC Design & Architecture  
Rivas, Inc.

**Mr. Jamil Kawa**

Synopsys Fellow Synopsys  
Solutions Group  
Synopsys

**Ms. Yilka Masada**

President and CEO  
Kelmendi Engineering Inc.

**Dr. Gokhan Mergen**

Software Engineer & Manager  
Google

**Ms. Lynn Olson**

Retired VP,  
High Performance Memory Micron Technology

**Ms. Zeel Patel**

Technical Operations Manager  
Amazon

**Mr. Kristoff Richter**

Managing Director of Test and Product  
Engineering  
Analog Devices

**Ms. Meeta Roy**

Director, Strategy & Planning  
Peloton Interactive

**Dr. Davood Yazdani**

Sr. Director of Product Marketing  
Infineon Technologies

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