



## ISE Senior Design Projects

### Spring 2021 Update

Our senior design projects continue to be a highlight of our students' learning experiences. The COVID pandemic created challenges, and our sponsors came through for us. This past fall semester, student teams completed variety of projects:

- Chick-fil-A, Mobile Meal Delivery
- Code With Us, Teacher Management
- Delta Products, Facility Operations
- El Camino Hospital, Hospital Bed Management
- Morgan Advanced Materials, Trace Thickness
- Spartan Superway, Inventory Management
- TTM, Imaging Throughput
- Western Digital, Semiconductor Manufacturing Throughput

We also kicked off another thirteen student teams for most of these sponsors, returning sponsors Lockheed Martin, Shipwire and the US Department of Labor and new sponsors C&D Semiconductor, Comet USA, MaxDecisions and NVIDIA.

**Thank you to all of your sponsors!**

If you are potentially interested in sponsoring a project, please contact Prof. Louis Freund at [louis.freund@sjsu.edu](mailto:louis.freund@sjsu.edu).





## Dr. Anil Kumar – Summary of 2021 Project Awards

### 1. Supportive Interface Design Guidelines

Award: **\$77,468** Sponsor: **Honda Research Institute, 2021**

Situational awareness should increase a driver's trust and lead to better secondary task performance. This implies that research is required to understand the factors that assist in designing systems to aid the driver/user. In general, any type of displays should be designed to allow drivers to glance at them easily and quickly with minimal tasking of the visual attention. Two common forms of displays for presenting information to drivers are head-up displays (HUD) and head-down display (HDD). This project will focus on the HUD interface, which could be distracting based on numerous factors including information content. The goal of this project is to assess an Augmented Reality ("AR")-based in-vehicle supportive interface given different presenting strategies and different traffic scene contexts. This collaboration will center on data collection and analysis of drivers' behavior and cognitive status e.g. workload and situation awareness when interacting with this interface.

### 2. Remote Human Factors Validation study of 3 mg sumatriptan autoinjector for migraine patients.

Award: **\$19,701.** Sponsor: **Noble, an Aptar Pharma company**

Laboratory research has decreased in a wide range of disciplines in the present landscape of COVID-19 pandemic. Almost all academic institutions (and consultants) have suspended in-person data collection and are not permitting any lab-based studies to proceed further. One industry that is heavily impacted is the medical device manufacturers who need to provide human factors validation to receive U.S. Food and Drug Administration (FDA) approval. Furthermore, in the most recent 2020 HFES annual conference, US FDA commented that they were currently "not aware of any data that supports the use of remote HF validation testing or of any consensus scientific guidelines or standards that can inform an acceptable remote HF testing approach. The objective of this study is to replicate the objectives of the original in-person study, which were to evaluate the design, ease of use, intuitiveness, and risks of a 2 stage autoinjector, determine whether the device can be correctly, safely, and effectively used by the intended user population without patterns of preventable use errors that would result in harm to the user, and confirm the device labeling and instructions for use (IFU) to support users in mitigating high risks and use contexts.

### 3. Understanding Safety and Usability of Personal Vehicles for Non-Driving Individuals with Disabilities and their Families

Award: **\$4,883.60.** Sponsor - **Mineta Transportation Center Grant #21-1100-5726.**

Funding Source: U.S. DOT, Office of the Assistant Secretary for Research and Technology

The project idea originated from Hannah Bowman, who is a graduate student in the HFE program. She is the Co-Principal Investigator on this project.

The shared personal vehicles of people with disabilities and their household family members plays an important role in the mobility and overall health and well-being of all involved people. Families that include a non-driving disabled member are more likely to be low-income and often struggle with the costs of operating a family car, but due to insufficient public transportation options, own vehicles despite their prohibitive cost. This study intends to provide a holistic understanding of how operating a personal vehicle used to transport a non-driving disabled individual influences the comfort, safety, and ease of use of all involved actors. Subsequent results from this research aim to provide insights and design recommendations that are actionable within the commercial vehicle industry; while providing visibility, representation, and perspective into this largely overlooked group of drivers and passengers



The Spring 2021 Faculty Spotlight is on...

## Dr. Yupeng Wei



Dr. Yupeng Wei joined SJSU as an Assistant Professor of Industrial and Systems Engineering in 2020. He received the B.S. degree from Beijing Institute of Technology, Beijing, China, in 2014, the M.S. degree from the University of Florida, Gainesville, FL, USA, in 2016, and the Ph.D. degree from the Pennsylvania State University, State College, PA, USA all in Industrial Engineering. His research interests focus on developing optimization models and deep learning algorithms for large-scale data with complex heterogeneous data structures. His research aims to extract latent variables or representations for the purpose of quality monitoring of complex systems, early detection of system anomalies, and system degradation prognostics and decision making. Dr. Wei is a member of ASME, INFORMS, IISE, and IEEE.

In addition to his teaching assignment, starting from Fall 2020, he has served on the research committee in the College of Engineering. He has also helped to determine Davidson Student Scholars' (DSS) rubrics, decide article processing charge (APC) policy, review proposals for the DSS program, and review project proposals of the Small Group Research Projects (SGP).

Dr. Wei is also participating in an inter-university project collaboration with the University of Central Florida, Pennsylvania State University, and the University of Tennessee on a research project. This project focuses on data analysis and deep learning for industrial engineering applications, which aims at estimating battery health conditions and predicting the remaining useful life of the lithium-ion battery to facilitate the reliable design of battery systems and safety operations, and detecting malware for industrial systems to address security issues in the context of smart manufacturing and Industry 4.0.

Yupeng and his wife, Wenmeng Gao, met as undergraduate Industrial Engineering students in China. After completing their IE Bachelor's degrees, they attended the University of Florida where they both completed the MS in Industrial Engineering. They now live in Atlanta, where Wenmeng Gao is a Project Manager with Veritiv, and is also enjoying the new experience of being a mom which began some 7 months ago. Dr. Wei had the interesting experience of joining the ISE Department at SJSU just as the Covid-19 shelter in place protocols went into effect. While living with his family in Atlanta, he began his SJSU career with a fully on-line approach to all of his class, research, and committee activities. We look forward to his joining us in person next fall.



The Charles W. Davidson College of Engineering

## 2020 Faculty Award for Excellence in Service

**Dr. Minnie Patel**

*The Faculty Award for Excellence in Service – Recognizes faculty with exceptional service to students, a department, the College, the University or to the community*



Dr. Niranjani (Minnie) Patel joined SJSU in 2002. She always wanted to be in California near family members. "When I got an opportunity to join SJSU I did not need much time to make a decision," she said. "First, it was like a dream come true. Second, when I interviewed for a faculty position in the ISE department, I felt at home right away mainly due to collegiality and welcoming attitude of my colleagues-to-be, and I saw an opportunity to grow in the environment. Moreover, I loved the SJSU campus, the city of San José, and its friendly people."

Minnie enjoys spending a lot of time in self-development and trying to understand the ultimate reality of this world. "I engage myself in activities that promote this understanding such as attending retreats expounding Indian Philosophical scriptures in quiet places. I coordinate two South San José Philosophical Study Groups to study Vedanta. I regularly do yoga, meditation and



## Dr. Minnie Patel, cont.

lightweight cardio exercises. I like to travel and explore places. I firmly believe that by serving others selflessly, purity of mind can be gained and this will help me understand who I really am and my relation to the world." Minnie is also currently developing her skills and knowledge in the area of data analytics.



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**Community Service Director**  
*Janelle Marcos*

## **IISE Student Club Officers 2020 - 2021**

## **IISE Student Club Activity Summary Fall 2020**

### ***Virtual Tour of Oracle Facility***

Alumni Eulises Valdovinos hosted a virtual tour of the Oracle Manufacturing Facility in Oregon where students had the chance to see how continuous improvement efforts support the manufacturing of servers. Moreover, students had the opportunity to attend a Q&A panel with different IE's inside the organization.

### ***Participated in IISE National Virtual Conference***

This year the IISE National Conference was held in a virtual setting. Attendees were able to attend various lectures from professionals as well as network with other students and professionals across the nation.

### ***Hosted an Internship Panel with members with Internship experience***

Our club hosted an intern panel where members could talk with and ask questions about how their peers were accepted into internships, as well as the experience they gained from these opportunities.

### ***Hosted Game Nights, Movie Nights***

IISE held several social nights in the form of Game and Movie nights for members to socialize.

### ***Resume feedback with ISE alumni***

In place of the 1 on 1 mentorship program we held in the past, this semester we held a roundtable resume workshop with alumni. Students were able to share their resumes with several alumni in various fields and get feedback on how to get ahead of the competition.

***Spring 2021 Activities Next Page....***



## **IISE Student Club Activity Summary**

**Spring 2021**

### ***Attended IISE Western Regional Conference***

The annual western regional conference gave students within the IISE student chapter an opportunity to network with other student and professional chapters around the region and attend lectures from people in the industry.

### ***Mock Interviews with ISE alumni***

ISE alumni from San Jose State carried out mock interviews with students in which the students had the opportunity to apply for three different positions in Supply Chain, Manufacturing Engineering, and Process Improvement jobs and get feedback on their interviewing skills

### ***ISE 101 with Dr. Dessouky***

Students had the opportunity to hear from the SJSU ISE department chair, Dr. Dessouky, about what ISE is and what role each one of the classes they are taking plays in their future careers. This served as guidance for students to understand how broad and versatile of a major ISE is

### ***Hosted Bi-weekly Social meetings***

SJSU IISE has kept in touch with its members through bi-weekly social events, which are called Office Hours. Each office hour is hosted by two IISE officers and is the time taken to watch movies, learn about job opportunities or just chat.

### ***Planned: Virtual Graduation Celebration***

In order to make graduation feel more special for the ISE students, our club has planned to host a virtual graduation celebration for the past 3 graduating classes. Students and recent alumni will be able to celebrate with their peers and have a chance to show off what they are currently doing, planning, or seeking.



**The Department Congratulates**  
**2020 Jindia Scholarship Winner**  
**Mr. Carlos Mendez**



Carlos is an international student from Guatemala and expecting to graduate from the BSISE program in May 2021. He also currently has an internship as the Assembly Tool Solutions Specialist at Integrated Manufacturing and Supply, where we assist manufacturing engineers in industry leaders such as Tesla, Western Digital, Northrop Grumman, Proterra, amongst others, on tooling necessary for their manufacturing operations. The company specializes in torque and assembly tools, robotic systems, rivet guns, impact and pulse tools, screw feeders, and ergonomic tool arms.

Carlos says that his objective is to become an industrial engineer specializing in the automobile or space industry. He's also looking into pursuing a graduate career in software engineering or specializing in manufacturing.

Aside from his educational career, he was also involved on campus by being Recruitment Chairman and Vice-President of the Alpha Tau Omega fraternity. He also is currently a member of the Order of Omega, which is an organization that recognizes the top 5% of the Greek Leaders on Campus.

Carlos' hobbies include weightlifting, listening to music, and playing basketball. An interesting fact: Before his weightlifting days, while in high school, he played for the National Basketball Team in Guatemala. Carlos relates that the team went to Hungary "for the FIBA U-18 World Championship. We played against Egypt, Germany, Lithuania, Romania and Andorra. Definitely an experience. We also attended a FIBA World Tour in Mexico. There was no age limit on this tournament and we went with the same team. I am the guy with the glasses and goggles (and the ball)."





**The Department Congratulates**  
**2020 Jindia Scholarship Winner**  
**Ms. Mamta Kanda**



Mamta Kanda is a May 2021 graduating senior pursuing her B.S in Industrial and Systems Engineering with a minor in mathematics. She has held leadership roles during her time at San Jose State University as the President of the Institute of Industrial and Systems Engineering Student Chapter and the Vice President of Tau Beta Pi, Honor Engineering Society. Under Mamta's leadership, the chapter was awarded Gold Status and the Most Innovative Chapter Event by IISE Headquarters. Mamta is also a Plant Engineering Intern at Lockheed Martin supporting their Facilities and Operations team.

As the Lead of the IISE student chapter's Community Service Committee (May 2018-May 2019), Mamta worked alongside the other officers to plan events for members and created events such as company tours and informational sessions. This committee organized fundraising events to get the entire IISE Club involved in the local community through bake sales (which resulted in a donation of over \$200 to the Make a Wish Foundation) and a Care Package Drive that created care packages to be donated to the Northern California fire victims. Each care package was filled with essentials, toiletries, and a personalized handwritten note. We also packaged sandwiched meals to give out to the less fortunate in downtown San Jose.

As an Engineering Ambassador during 2018-2019, I mentored first-generation, low-income high school students. She went to various high schools such as Santa Teresa, James Lick, and Oak Grove to help students with their Science Fair Projects and provide feedback on how they can improve their projects and still be within the guidelines set by the competition.

Upon graduation, Mamta would like to work for a few years to gain industry experience and be able to implement the optimization methodologies she earned in the classroom. Soon after, she would like to return to school and pursue a master's degree to further solidify my industrial and systems engineering background. Through this process, she would like to give back to the community and provide guidance and mentorship to college students in the same ways that I was guided in my college career. Mentorship was extremely valuable to me during my college experience and I hope to continue the cycle of giving back and inspiring others to do the same.

**Next page for a "little known fact" .....**



## Mamta Kanda Award, cont.

A little-known fact about Mamta: during her free time, she enjoys doing nail art. Mamta writes:

Nail art is a hobby I picked up during elementary school and have been doing ever since. I mainly just do my own nails because it provides me with a creative outlet. Some of the wildest nails I have done are probably when I decided to dedicate my nails to the internships that I was engaged in.

This past summer I was at Cisco as a Business Analyst Intern and decided to show my appreciation for my wonderful experience through my nail art (left photo below). I also did a similar concept for my internship at Lockheed Martin (right photo below). I enjoy experimenting with different designs on nails and trying out new techniques and products!





## The Department Congratulates

### Winner of the May, 2020 College of Engineering Donald Beall Rockwell Award for Engineering Accomplishment

#### Mr. Arman Toplu, MSISE



Arman completed the MSISE in 2020, after two years of study. Prior to entering SJSU, he worked more than 14 years as a product manager in Istanbul, Turkey. He reports that “returning to academia after a long time in a new world was a hard decision since I had to leave my comfort zone in my home country.”. But he had strong convictions about continuing his education and noted that SJSU, being in Silicon Valley would put him at the “heart of technology”

On arrival, he found himself facing and addressing many difficulties, including life accommodation, transportation and a radically different education system. As his comfort and familiarity with US life developed, he found that he had the urge to serve other Turkish young people who were facing the same challenges in the beginning years of their life in the US. Consequently, in his second semester on campus, and together with his wife who is also (currently) an SJSU graduate student, he started a new student club to unite the Turkish community at SJSU, called the “Turkish Student Association”. The aim has expanded to not only help new Turkish students to adjust their life at SJSU but also to also offer assistance to domestic SJSU students who are interested in studying abroad in Turkey.

Arman has consistently exceeded in all areas of his coursework despite the challenges in the beginning of his student life at SJSU. He reports that he not only had the chance to learn about core IE subjects like Supply Chain and Operations & Research but also was able to study hot topics like the Circular Economy. During the two years of study in our program, Arman maintained a 4.0/4.0 GPA.

He started his culminating project research in Spring 2019 under the direction of Dr. Hongrui Liu. The topic of

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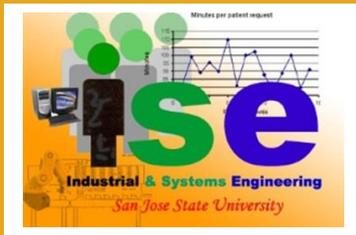


## Arman Toplu Award, cont.

his research was “Designing a Deceptive Comment Detection Platform with a Rule-Based Artificial Intelligent Algorithm”. The topic involved knowledge in industrial engineering, statistics, computer science and applied math, with extensive requirement for coding. This became an added project completion challenge, since Arman hadn’t done much since his Bachelor’s degree in 2005. I. He effectively brought himself up to speed again with the needed skills through extensive self-study and literature reviews.

While pursuing his graduate studies, Arman reports that he had various chances to participate in events in the area. Autonomous cars, blockchain technologies, and cloud computing are the topics that he likes to follow. In addition, especially after the pandemic started, he had more opportunities to visit the beautiful parks around the area that he can cycle, one of his hobbies in Turkey. Next winter he hopes to take up snowboarding in the Lake Tahoe area.

Arman says that after graduation, the skills and experience he gained during his ISE Masters program helped him a lot landing a job in the Bay Area despite the uncertainty due to the pandemic. Currently he is working as a Data Scientist in the Supply Chain field.



The Alumni Spotlight is on...

## Ms. Sonia Ferrell



Sonia Jimenez Ferrell received a B.S. in Systems & Industrial Engineering from San Jose State University in 2000, and a Masters degree in Organizational Leadership from Saint Mary's College of California, Moraga (2012)

Sonia has over 18 years of experience in HR, Process-Improvement, facilitating, coaching and leadership. She has spent the past decade studying leadership, values, emotional intelligence, and interviewing over 40 entrepreneurs and leadership experts on success strategies. This work has included collaborative research on developing capacities to deal with stress and overwhelm (thesis project). She is the co-author of the #1 International bestseller: Step into your Brilliance.

She currently coaches and trains individuals and professionals who feel stuck and want to succeed in their life and career; by sharing her 6-step formula for success.

Sonia is a Bay Area native, a wife, mother, professional, and mentor for high school and community college students in her area. She is an advocate of STEM programs.

Contact: [sjferrell5@gmail.com](mailto:sjferrell5@gmail.com)

LinkedIn: Sonia Ferrell, MA



## The Alumni Spotlight is on... Mr. James Flissinger



James Flissinger was born and raised in Southern California. He made the intrastate journey to Northern California to start his academic career at San Jose State University (SJSU), where he earned his B.S. in Industrial & Systems Engineering. After graduation, he started his professional career in the Aerospace & Defense Industry with Lockheed Martin as an engineering planner. His next career move was to BAE Systems as a logistics engineer, where he was exposed to more business elements; this is when he decided to further his academia concurrently at Santa Clara University (SCU) to pursue his M.B.A. His focus there was in the areas of marketing and finance, which he had realized was in the direction of his career passions. After completing his degree at SCU, he made the move to Northrop Grumman where he obtained a position in program management. With the balance of engineering and business under his belt, he advanced quickly to become a senior division manager over a large organization. His current position is with Science Application International Corporation (SAIC) as a consultant supporting our country's newest military branch, the United States Space Force.

James looks back on his BSISE experience with substantial respect for the curriculum's projects, presentations and teamwork experiences. As his career got underway, his "first job involved team interactions"; he was able to build on his experiences in the curriculum and other "hands-on" features of the ISE program to successfully navigate and grow in his career. As his experience broadens in successive positions, he looks forward to becoming involved in corporate acquisition strategies and financial management to support his future career move into Program Management.

Aside from the heavy demands of his career, James is a member of the ISE Department Advisory Council (DAC), where he provides much appreciated advice and counsel regarding curriculum, mentoring, and program plans. He also responds quickly to providing advisory support to his wife's business and engaging as much as possible with his family to fill up whatever "hobby" time he may have. An interesting fact about James: he's also into men's clothing styles (stemming from an early job at a men's clothing retailer), and routinely is viewed as being "overdressed" for every occasion – but, as he says, it keeps him feeling great about himself as he goes about his day.



The Alumni Spotlight is on...

## Dr. Dina Verdin



Dr. Dina Verdín received a BS in Industrial and Systems Engineering from San José State University in 2013. She then went on to Purdue University where she completed an MS in Industrial Engineering and a PhD in Engineering Education. As a Purdue graduate student, Dina was a National Science Foundation's Graduate Research Fellow and an Honorable Mention for the Ford Foundation Fellowship Program. Of note is that her dissertation proposal was selected as part of the top 3 in the 2018 American Educational Research Association (AERA) Division D In-Progress Research Gala.

Dr. Verdín's research has been recognized in multiple venues. Her 2020 research was selected to receive Honorable Mention for the Best Paper Award in the ASCE Journal of Civil Engineering Education, she was a finalist in the 2020 Best Diversity Paper in ASEE's Educational Research and Methods Division (ERM), and was a 2018 ASEE/IEEE Frontiers in Education Conference Best Diversity Paper Award recipient. Her research interests focus on changing the deficit base perspective of first-generation college students by providing asset-based approaches to understanding this population. Dr. Verdín is interested in understanding how first-generation college students author their identities as engineers and negotiate their multiple identities in the current culture of engineering.

When she's not focusing on her research agenda or teaching classes, she's outside discovering the hiking trails around the Phoenix metro area.

Dina has provided this personal statement regarding the development of her career path:

When I was an undergrad at SJSU, I was heavily involved on campus. I joined a ton of organizations and participated in a number of activities. I thought I wanted to go to graduate school to study student affairs but I wasn't ready to leave all my engineering training behind. Once I knew I wanted to go to graduate school I applied to the McNair Scholars programs which is designed to prepare students to develop a competitive graduate application.

Dina's story continues on the next page.....



## Dr. Dina Verdin, cont.

The application process meant that I was tasked with figuring out my research interest. As a McNair Scholar I was also required to engage in research activity.

My first research project was through an REU (Research Experience for Undergraduates) at the University of Cincinnati focused on Optimizing Operations in Complex Semiconductor Manufacturing Processes. I have to admit semiconductor manufacturing wasn't my jam but the experience was invaluable as it was my first exposure to working in a lab, reading scholarly journal articles, synthesizing literature, and the overall process of discovery that comes with doing research.

The idea of developing or building new knowledge fascinated me. I decided my next summer research project would be on a topic that was more connected to my interest. I sort of went back to the idea of student affairs but specifically focused on women in engineering.

My second research project focused on understanding the experiences that lead a group of Latina first-generation college students to pursue engineering. At the time I was unaware that there was an entire School focused on training graduates to conduct research engineering education but I went ahead with my study feeling that this was the connection with engineering and student affairs that I was looking for. Soon after I learned about Purdue's Engineering Education PhD program, I applied and was admitted.

## Dina Verdín, PhD

Assistant Professor of Engineering Education Systems & Design

The Polytechnic School

Ira. A. Fulton Schools of Engineering

Arizona State University

[Verdín Website](#)

More information about Engineering Education Systems & Design (EESD) PhD Program <https://poly.engineering.asu.edu/engineering/phd/>



Fall 2020

## Summary of the Alumni Breakout Discussions Pertaining to the Impacts of Covid-19



About half-way through the meeting, the attendees were randomly divided into breakout rooms to discuss the impact of COVID-19 on their work, and on how their companies operated. After 20 minutes, the groups reassembled and reported their key discussion points. These include observations such as the following:

### How Has Covid-19 affected your professional activity?

- Previously, my job required me to travel internationally at least 10 times a year; but none during the pandemic.
- Requirement to be 50% onsite to observe the production line, production flows and facilities to collect data and propose redesign options has not changed. The other 50% of her work can be done remotely.
- For some work load has been increased as well as productivity along with it; for others work has become hectic and very difficult due to family interaction and distraction during work hours.
- For some colleagues this time has been quite effective, especially for those working globally. They have been saving commute time and distractions. There was more work done within the same week; for other colleagues the lack of physical interaction has caused a negative effect and productivity.

### How is the IE profession impacted by Covid-19?

- It seems Covid has pushed technology to enable us to do a substantial amount of work virtually.
- At the same time it has created new opportunities such the acceleration of purchasing thru internet. This generates new IE jobs such as in Supply Chain.



**Fall 2020**

## **Summary of the Alumni Breakout Discussions Pertaining to the Impacts of Covid-19, Continued**

### **What are some solutions that you have found to be most helpful to you?**

- Designating a place at home to work remotely.
- Enhanced time management strategies. Set boundaries for at home daily activities to provide sufficient time for work responsibilities.

### **How your company has changed or evolved?**

- Our companies continue their business thru virtual meetings, text, and phone calls and video calls. However manufacturing work was hard to deal with,
- Company may hold weekly or monthly leadership meetings with individual contributors on the status of Corona Virus and new guidelines.
- Weekly meetings about COVID to help employees about what are our personal impacts of COVID, focused on mental health.
- Moving all the workout classes online. There is an app that people can use to mental health.
- Company took the opportunity to develop COVID related medical devices, tools etc. Check symptoms, self help devices and tools.
- Use zoom, slack,
- Holding monthly zoom party. Developing team is all over the world, very international gathering.
- Did a lot of lunch-and-learns. Offered people to order food to door dash and deliver food to home.
- Travel has stopped, gives time back to the family. Will travel internationally be the same going forward.
- Working from home is new to Locked Martin. Security is a major concern. A lot of production is being done in house.
- Maintaining safety a top concern.
- Need to define and track Covid-19 KPIs.
- (Pharmaceutical) - 80% is covid testing kits. Super busy. Manufacturing team needs to be in-person, food is provided.

### **What great new ways of working your job/position have you?**

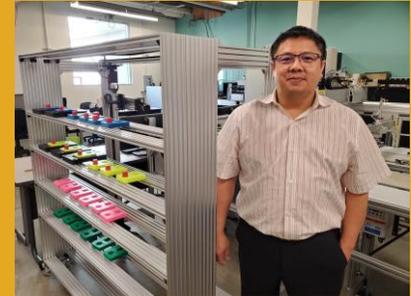
- Having a room or office at home was the easiest. Some companies were already into remote work many years ago, and some colleagues work remotely across the global with their teams.
- Also, in these days there are more jobs opportunities by working remotely.



Spring 2021

## Update on the Computer Integrated Manufacturing (CIM) Lab Upgrades

Nearly three years ago, the ISE Department embarked on a project to revamp and upgrade the Computer Integrated Manufacturing Lab in Room 194. The goals of the project were to revamp the equipment, software infrastructure, and layout of the room to enhance its reliability, appearance, and effectiveness for teaching and research. Mr. Tom Pham, an SJSU BSISE who returned after many years in industry, proposed and, over the course of the last year and a half, implemented the plans. Tom was able to accomplish much of this work on a part-time basis during the pandemic, while also fulfilling his role at a local software company. Concurrently, he began handling the lectures of ISE 115, the core ISE Lean Integrated Manufacturing course, which uses the CIM lab each week to teach ISE students about current manufacturing systems concepts.



Mr. Tom Pham, CIM Lab Specialist with ASRS he designed and built.

Today, we see the initial objectives of this upgrading project nearing completion. A list of some of the new elements that are now in place and operational is presented below:

1. Convert conveyor operations, robot systems and inspection station to **wireless communications and control**, arranged for **better security, safety, and reliability** of lab operations.
2. Design, development, testing and installation of a new **Data Base Management System** for robot and conveyor operations and control (Communications Workstations).
3. Acquisition and installation of an **Omron Hornet robot and SmartVision system**, a state-of-the-art suspended robotic device that enables items to be gripped moved and released at high speed.
4. Acquisition of an **Omron LD series mobile robot**, received as a part of an Omron grant to the ISE department.
5. Design, build and install an **Automated Storage and Retrieval System (ASRS)**. The purpose of this unique robotic system is to enable the loading and unloading of pallets from the conveyor.
6. Installation of **4 new 3D printers** that have been used to create parts for the conveyor system and robot stations as needed. Like other elements of the lab, these printers are also included in the lab's teaching program.
7. Acquisition of a **CNC router and CNC lathe** as gifts from the College's Engineering Shops to increase opportunities for students to learn about the capabilities and applications of such machines. Refurbishing is in the plans for this summer.
8. **Refurbishing the room** with to finalize a "showplace" look and feel. The room is used for ISE open house events, and represents the ISE program in many ways.

**Going toward** the fall and the expected resumption of on-campus instruction and activities, we are looking forward to hosting classes and visitors in the "new" and much improved CIM lab.