



Undergraduate and graduate students from biomedical engineering and mechanical engineering research the biomechanics of gait, balance and youth pitching in the Human Motion Biomechanics Lab under biomedical engineering professor Scott Hazelwood and mechanical engineering professor Steve Klich.

FACULTY & STAFF NEWS

Fall 2021



CAL POLY
College of Engineering

STAFF SPOTLIGHT

Getting to know

Ben Carr

Mechanical Engineering

Electromechanical Tech III

Can you describe your journey to Cal Poly?

I received my skillset primarily as an electronics technician in the U.S. Navy serving aboard the *USS Enterprise (CVN-65)* from 1997-2003. I finished a B.S. degree in Information Technology and left to continue my electronics career as a field engineer for General Dynamics working on satellite communication systems for the Information Security Engineering Corps. That job led me here to San Luis Obispo County, where I was doing installations at Camp Roberts in San Miguel and met my wife, Clara Carr.

We decided to stay in this area, and I accepted a job as a network security and information technology lead at Camp Roberts. After working there for five years I started my current job here at Cal Poly.

How long have you worked at Cal Poly — and what do you do most?

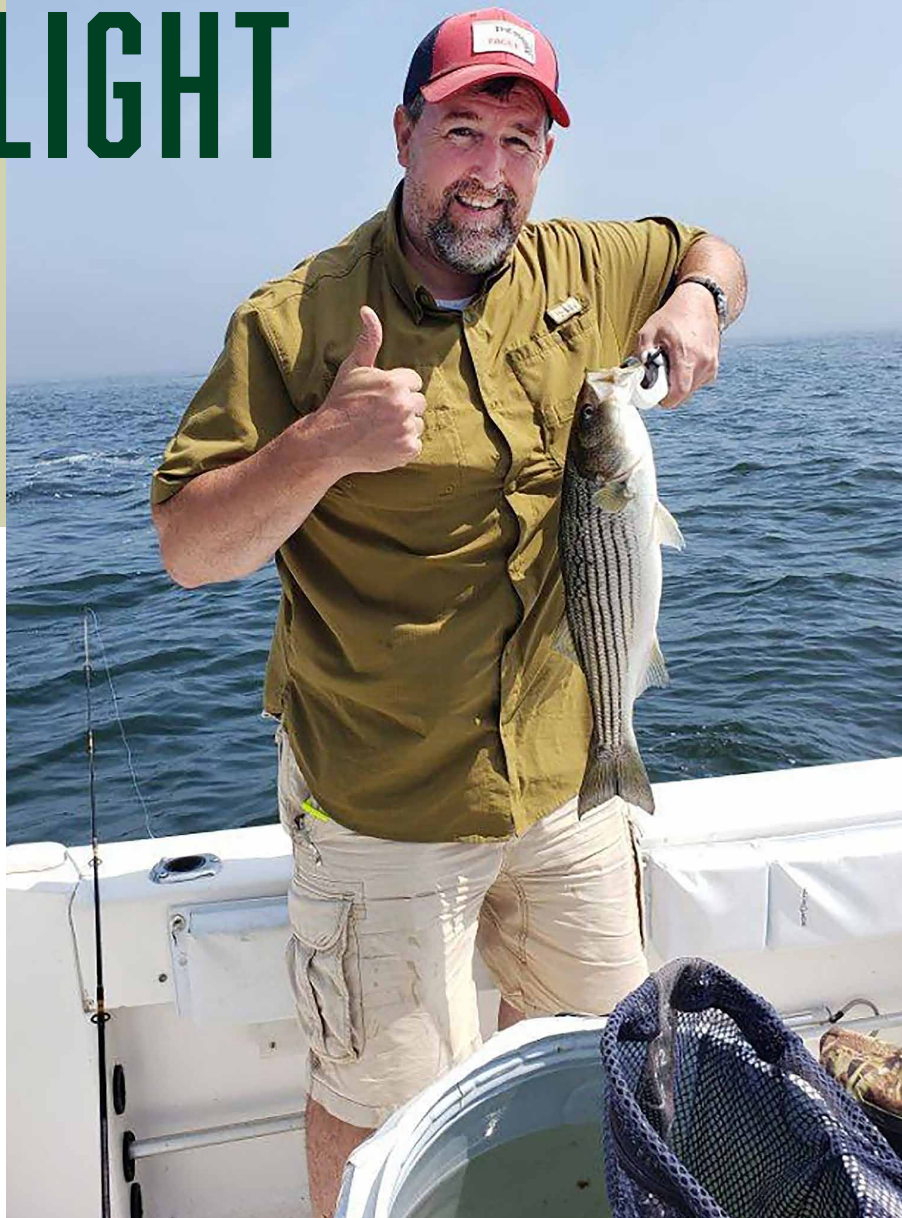
I have been here since Sept. 14, 2014. I have mostly worked in IT within the Mechanical Engineering Department, but recently changed my job description to electromechanical tech III.

My duties are varied and sporadic. I do everything from general maintenance and cleaning of labs and equipment, to installing, calibrating, troubleshooting and repairing existing instrumentation, laboratory equipment and systems. I am able to assist students, faculty and other staff with various services or technical problems, including fabrication, installation, configuration, maintenance and repair of mechanical and highly complex electronic equipment and systems, as well as occasional computer and equipment assistance for student projects and clubs when appropriate.

I also work with vendors on specifications for new equipment; assist students with design and senior projects; and maintain department equipment which includes repairing malfunctioning or damaged lab equipment, procurement and installation of replacement parts as well as researching and selecting equipment replacements for irreparable devices.

What achievement are you most proud of?

Being able to successfully serve and meet the needs of a



Ben Carr likes to fish for stripers when not working in the Mechanical Engineering Department as a electromechanical tech.

complex organization with a diverse group of students and faculty over the last seven plus years.

What do you like best about working at Cal Poly?

Hands down, it is the people that I work with.

What is your favorite place on campus?

The lawn between Palomar and Diablo, where I have lunch with my wife Clara.

What do you like to do when you're not working?

I spend time hiking and fishing with my daughter Leslie and son Orman. I also enjoy backpacking with my buddy and supervising director of the Cal Poly Machine Shops, Jim Cullins.

What is on your "bucket list" of things you'd like to do one day?

I want to backpack the Pacific Crest Trail. ■

Have a faculty or staff member you would like to see highlighted? Email cengnews@calpoly.edu their name, job title and a brief description of why you would like to see them highlighted!

DEPARTMENT FUNDING SUCCESSES

MATE Anniversary Campaign

The Materials Engineering Department anniversary campaign recently finished with a total of \$44,382 raised. This year-long fundraising effort entailed strong support from the advisory board and Chair Trevor Harding. A series of video messages, email blasts and virtual and in-person visits allowed the department to share the history of the MATE Department and the bright future ahead.



Materials engineering alumnus Bob Adams polishes the stainless-steel part of “Atom Shifter,” a sculpture he helped build with designer and classmate Steve Paterson to honor the MATE Department’s first chair R.C. Wiley and the department’s 60th Anniversary. The sculpture, which was installed near Building 141, depicts two common atomic arrangements of iron.



Gift to Improve CSSE Data Visualization Displays

The Computer Science and Software Engineering Department recently received a gift of \$15,000 for its data visualization displays. This gift will update the computer displays that support the data science courses so students can use more immersive visualizations. This opportunity was presented by the department after noting the need and fit the philanthropic focus of corporate donor, Chevron. The gift will allow Chevron to enhance the visibility of the company through technology in CSSE department classrooms while offering up-to-date Learn by Doing opportunities to students.

Aero 470 Course Inspired Students to Create Art

12.8.2021



For his Aero 470 class, John Grimes created a space-themed video titled "Other Worlds."

Pauline Faure, a faculty member in the Aerospace Engineering Department, created a course, Aerospace Beyond Engineering, which explored the non-engineering aspects of the aerospace industry that are critical to the development and sustainment of aerospace systems. His video, "Other Worlds," was one of multiple projects posted to an online art exhibition created for Aero 470 – Aerospace Beyond Engineering. The virtual course was created by Assistant Professor Pauline Faure, who wanted students to explore non-engineering aspects of the aerospace industry that are critical to the development and sustainment of aerospace systems.

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At the beginning of John Grimes' video short, three students lie on the grass in Poly Canyon, gazing at the stars.

"Doesn't it ever make you wonder what's going on up there?" one of them wonders aloud. "All the stories and adventures that could be happening?"

Then, a fantasy sequence illustrates some of those possibilities, including an enemy soldier fleeing a laser-shooting spacecraft and a couple of aliens who groove to – why not, really? – Marvin Gaye's sultry "Let's Get It On."

"The idea was that people throughout time have always looked up at the stars and imagined different worlds that are based on the reality of their lives," Grimes said.

Amelia Earhart's Visit to Cal Poly Remains an Inspiration and a Reminder About Women in STEM

11.29.2021



When Amelia Earhart visited the Cal Poly campus 85 years ago, she commented about the lack of women. Today, Cal Poly and other CSU schools are hoping to increase the number of women in STEM fields.

When Amelia Earhart visited Cal Poly 85 years ago, she was an international celebrity, a record-breaking pilot at a time when most women didn't even dream of pursuing aviation careers.

"She must have been amazingly strong and confident to do what she did all those years ago," said Kira Abercromby, a professor in the Aerospace Engineering Department. "What I really hope is that people looked at her like the amazing pilot and adventurer she was."

Yet, decades after the Purdue University faculty member dropped by Cal Poly's aeronautics program, women are still significantly under-represented in STEM – both in industry and at universities.

"We are fighting an uphill battle," Abercromby said. "However, that is not to say that we can't figure it out."

In an effort to win that battle, Abercromby will participate in a federal-funded program aimed at increasing the number of female faculty in engineering colleges across the CSU. Abercromby hopes more female STEM faculty will also lead to more female STEM students.

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IDEAS Grant Speaker Series Begins

11.5.2021

Sara Della Ripa, biomedical engineering lecturer, and her class hosted a series of presentations through the IDEAS grant speaker series.

Engineering IDEAS Grants (Inclusivity, Diversity, and Equity Action Seed) are a resource open to all faculty, staff, and students of CENG who want to make a difference with creative and innovative solutions to foster welcoming initiatives.

These mini-grants are intended for small projects ranging from \$200 to \$1,000, with exceptions up to \$2,500 in special cases.

Speakers included: Anu Parvatiyar, founder and CEO of Ananya Health who discussed cervical cancer in a global context; Sonia Killebrew, midwifery student who discussed roots of slavery in the fields of obstetrics and gynecology; and Anna Lee, co-founder and Engineering VP of Lioness, who discussed sexual wellness for people with vaginas and how it ties to health.

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Otto Aviation Uses Cal Poly Boundary Layer Data System in Flight Test

10.27.2021

After conducting several successful flights of its new Celera 500L prototype aircraft in 2019, Otto Aviation (ottoaviation.com) contacted Donald E. Bently Professor of Mechanical Engineering Professor Russ Westphal to inquire about use of the Boundary Layer Data System (BLDS) in its flight test program. BLDS was of interest because of its unique “stick on and go” paradigm, allowing for rapid and flexible acquisition of local surface flow measurements in flight without impacting single-pilot in-flight workload or connecting to aircraft systems.

During late 2019 and early 2020, the BLDS project team—with participation of the Autonomous Flight Lab (Professor Aaron Drake, director) supported three flight test projects under contract on site at Victorville, CA. Three Cal Poly engineering students

— Sean Casteel, Eric Ashley, and Luke Bodkin—participated in these tests by installing the BLDS instrumentation, pre-flight check-out and launch, post-flight data download, and data review. They experienced firsthand the excitement of working on an all-new design and interacting with senior professionals, including pilot Bjarni Tryggvason — a former NASA astronaut.



BLDS on forward fuselage of the Otto Aviation Celera 500L, illuminated by the dawn light.

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Aaron Keen Receives Cal Poly Distinguished Teaching Award

10.6.2021



Professor Aaron Keen was honored by Cal Poly for teaching.

Cal Poly Computer Science and Software Engineering Professor Aaron Keen credits his preparation, availability and attention to students for receiving the 2019-2020 Cal Poly Distinguished Teaching Award (DTA) at the Fall Conference in mid-September.

“I believe what many of my students really appreciate is the time that I give to them outside of lectures, whether that be in lab, in office hours, through email, or on the Q&A forums,” he said. “Though I aim to hold lectures wherein everybody can participate, it is the individual, one-on-one support that can really make the difference for some students.”

Judging from the comments in the nomination letters from students — only students, alumni, and those who have been influenced most by faculty are eligible to submit DTA nominations — Keen is clearly making a difference.

A sampling from the nominations:

“His teaching style is beyond exceptional. I took my first course with him during my third year and have jumped on every opportunity since to take others with him.”

“Dr. Keen is one of the most prepared and knowledgeable professors that I’ve had.”

[READ MORE](#)

Faculty Work Closely with Students During the Summer Undergraduate Research Program (Video) 10.6.2021

The Summer Undergraduate Research Program pairs students with faculty mentors, who work closely with students new to research over the summer. The research, often sponsored by industry, allows students to gain experience conducting relevant research. The 2021 program, featured in this video, included close to 20 research projects from a variety of disciplines.

[VIDEO LINK](#)

Summer Undergraduate Research Program students are working on thermal analysis of a 3U spacecraft and testing of maximum power point tracking based electrical power subsystem for the handling of 100W.



Biomedical Engineering Professor Scott Hazelwood Named Distinguished Scholar

9.13.2021



Biomedical Engineering Professor Scott Hazelwood works with students in the Human Motion Biomechanics Laboratory.

As infrared cameras captured the amputees' movements on exercise bikes, treadmills and elliptical machines, faculty and student researchers were especially interested in how much stress their subjects were placing on their knees, hip joints and cartilage.

“One of the biggest challenges is how to integrate human-made materials that can be quite stiff with living, less-stiff biological tissues that have various responses to the objects they are interacting with,” said Scott Hazelwood, a biomedical engineering professor and one of a team of faculty members who lead the Cal Poly Human Motion Biomechanics Laboratory.

“The main contribution of my students and myself on these projects was to use the information gathered from the motion analysis experiments to generate whole knee computa-

tional models to examine the buildup of pressure on the cartilage on the knee — and, therefore, the risk of arthritis — throughout the motions of these exercises.”

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Computer Science Professor Foaad Khosmood Named Distinguished Scholar

9.13.2021

It might seem surprising that the co-founder of the world's largest game-developing event didn't have access to a computer growing up. But as a child in Tehran during the Iran-Iraq War, Foaad Khosmood and his family were more focused on survival than computer games.

“Tehran was getting bombed and rocketed all the time,” Khosmood said. “We used to go look at the rubble afterward. I saw six- and seven-story buildings flattened.”

While Khosmood has been in the United States since he was a teen, his life experiences continue to drive his actions, as an activist who has protested war and a professor who has worked to make the democratic process more accessible to the public.

“I do always want to have an impact here,” said Khosmood, one of three Cal Poly faculty members honored as a 2019-20 Distinguished Scholar.

During the eight-year war with Iraq, Khosmood's father emigrated from Iran with his two sons, fleeing first to Turkey and then Germany, when Khosmood was in the sixth grade. Unable to work in Germany as an immigrant, Khosmood's father moved the family to San Jose, California, where the family survived on public assistance as Khosmood's father pursued a real estate career.



Cal Poly Computer Science Professor Foaad Khosmood co-founded Global Game Jam as a grad student.

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Big Jobs, Big Toys, Big Money: Granite Heavy Civil Minor Gets New Director 9.8.2021

In a story he often repeats, Ed Boucher recalls someone asking him to define what heavy civil construction is.

“I said I’ll do it in six words,” Boucher recalled. “Big jobs. Big toys. Big money.”

After more than 40 years working those big jobs, Boucher retired from the industry to focus on teaching, a significant career shift that began in 2018. Now, as the new director of the Granite Heavy Civil Minor (GHCM) Boucher will have to both teach and sell the industry to prospective students.

“Heavy civil is not a career for everybody,” he acknowledges. “What I tell people is if you’re looking for a 40-hour-a-week job, you might want to rethink this.”

Yet, he added, the career is a “blast,” packed with action and – as he says – big projects.

“Who builds space launch platforms? Heavy civil. Who transports million-pound loads across the country? Heavy civil. Who developed the demolition cleanup plan for the World Trade Center?” he said.



Ed Boucher, the new director of the Granite Heavy Civil Minor, discusses his career and the industry.

[READ MORE](#)

Questioning “The Way It Is:” New Course Bridges Gap Between Social and Technical Aspects of Engineering 8.9.2021



Ben Lutz teaches a new course that examines societal pressures on the engineering design process.

In the syllabus for his Engineering, Design and Social Justice course, Ben Lutz makes clear that students must use evidence to support claims made during classroom discussions.

With a topic that can be emotionally charged, he said it’s good to let students know from the outset that social justice in engineering represents an area of scholarly inquiry, with scientific methods for discussion.

“We’re not just talking about how we feel,” Lutz said. “When we talk about inequities, we want to come up with evidence, and I want students to know there is evidence out there.”

Lutz suggested the class after the murder of George Floyd sparked wide discussions on racial inequity and social justice. While the killing of Floyd and other Black people brought attention to inequities in law enforcement responses, the events have also drawn attention to the way other fields address existing inequities.

“I think the timing was right for something like this,” said Lutz, who was one of 16 tenure-track assistant professors hired campus-wide in 2019 to promote inclusive teaching strategies.

Lutz’s new course, which he taught for the first time in the spring of 2021, aims to show how engineering designers and design processes both shape and are shaped by societal forces.

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MORE FROM THE CENG BLOG

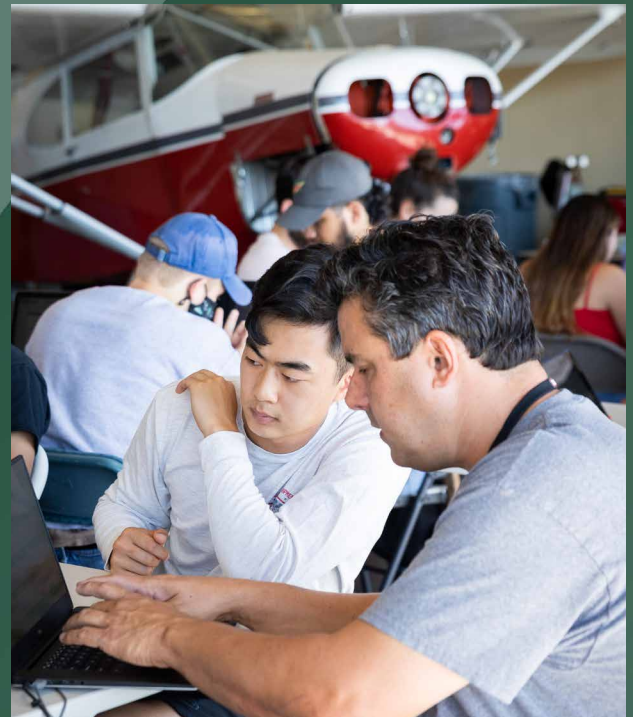
READ THE BLOG [HERE](#)

- Civil Engineering Professor Damian I. Kachlakev was featured in the leading Bulgarian publication of the construction industry, Builder. [MORE](#)
- Civil and Environmental Engineering Assistant Professor Shams Tanvir was recently a featured expert in WalletHub's article "Best & Worst Cities to Drive-in." [MORE](#)
- Mechanical Engineering Professor Mohammed Noori was invited to be guest editor of a special volume of Sensors Journal and published journal papers. [MORE](#)
- Electrical Engineering Professor Taufik delivered keynote speeches (virtually) at international energy conferences. [MORE](#)

FACULTY FOCUS

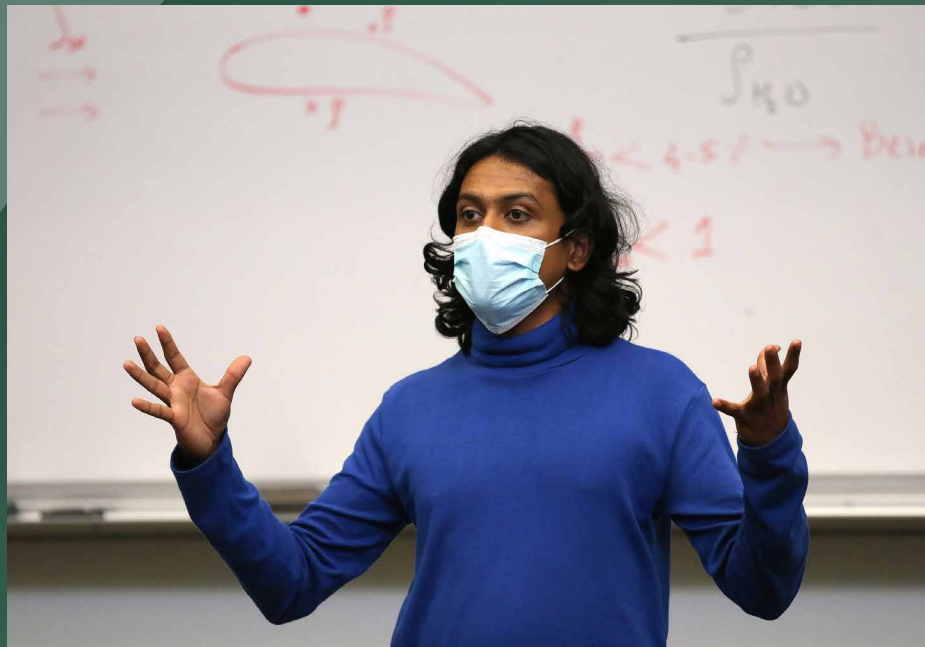


▶ Mechanical Engineering Professor Jacques Belanger and Summer Undergraduate Research Program students are working with a model of the 4.5 MW Gold Tree solar field on Cal Poly's campus with the ultimate goal of optimizing the solar field's energy generation.



▶ Students in Cal Poly Aerospace Engineering Professor Paulo Iscold's AERO 425 (aircraft performance) class learn to predict the performance of the university's RV-7 airplane.

▶ Aerospace Engineering Professor Nandeesh Hiremath is masked up while teaching fluid mechanics in the Baker Science building.



FACULTY FOCUS

▶ Professor Zachary Peterson leads freshmen computer science students through his network security board game [dox3d!] in the refurbished Cal Poly Northrop Grumman Cybersecurity Lab. Peterson developed the game as an early exercise for CSC 123: Introduction to Computing.

Environmental engineering professor Amro El Badawy works with civil engineering student Adam Monroe on conducting undergraduate research using nanoparticles to detect microbes in drinking water. ▼



▶ Biomedical Engineering students Rayana Gutierrez, left, and Tori Barrington, right, are working with Professor Trevor Cardinal on a Summer Undergraduate Research Program (SURP) project that involves the development of cell therapies.



▶ Civil Engineering Professor Hani Alzraiee, second from left, teaches the use of a Faro Laser Scanner to civil engineering students Ryan Trainor, left, Luke Psomas and Joey Lombardo. The scanner is used to make 3D models of bridges and buildings.