

CALIFORNIA STATE UNIVERSITY, CHICO



CONNECTIONS

College of Engineering, Computer Science, and Construction Management

ECC CONNECTIONS

California State University, Chico
College of Engineering, Computer Science, and Construction Management

400 West First Street
Chico, CA 95929-0003

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ATTRACTING AND RETAINING
ENGINEERING STUDENTS

ALUMNI H. KIT MIYAMOTO

BATTLE OF THE BRAINS

SUSTAINABLE MANUFACTURING

SPRING 2011

CALIFORNIA STATE UNIVERSITY, CHICO



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From the Dean

CONNECTIONS, SPRING 2011

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Michael Ward, *Dean*

Greetings to you from Chico!

When we selected Dr. Hideki Kit Miyamoto (CE, '89) as the College of Engineering, Computer Science, and Construction Management's 2011 Distinguished Alumni in February, we had no idea how he would further distinguish himself just one month later.

On Friday, March 11, 2011, Kit and his family had just left Fukushima, Japan en route to Tokyo just hours before the devastating earthquake and tsunami struck. Kit and his family escaped the disaster and made it safely back to Tokyo, where his parents still live. He spent days traveling in the country and delivering eye witness accounts of the event and subsequent aftershocks.

This experience is but one chapter in Kit's very personal as well as professional journey since leaving Chico. He now stands among the world's foremost authorities on structural design, analysis, and retrofit/repair – particularly as it relates to seismic mitigation strategies. We are extremely proud of Kit and the work he is doing worldwide to improve living conditions for those who are most in need. I am sure you will find Kit's life story truly inspirational.

This issue also features wonderful stories about student achievement and challenges, ranging from student participation in IBM's International Collegiate Programming Contest to winning the Sustainable Manufacturing Grand Prize in SME's Manufacturing Challenge. You will also learn more about the national recognition we have garnered for graduating minorities in STEM fields; an honor that is well deserved and greatly appreciated. These stories emphasize why it is important to continue to improve the state of higher education for future generations of engineering, computing, and construction professionals – all of whom are critically needed by our country.

As many of you know, part of the governor's effort to tackle the state's budget deficit means Chico State and the college now face tremendous budget challenges as we work to find creative ways to move forward. Our faculty and staff continue to put student progress and student success in the forefront, in spite of larger class sizes and heavier workloads. I am extremely proud of them for putting our students first, and am thankful for your continued support of our efforts. Your generous charitable gifts are appreciated today more than ever, and I thank you for your continued support of the college so that future students will be able to experience the quality education we aspire to provide.

“These stories emphasize why it is important to continue to improve the state of higher education for future generations of engineering, computing, and construction professionals – all of whom are critically needed by our country.”



Holistic Program Attracts and Retains Engineering Students

“MEP has been instrumental in recruiting good students, retaining them and helping them graduate.”

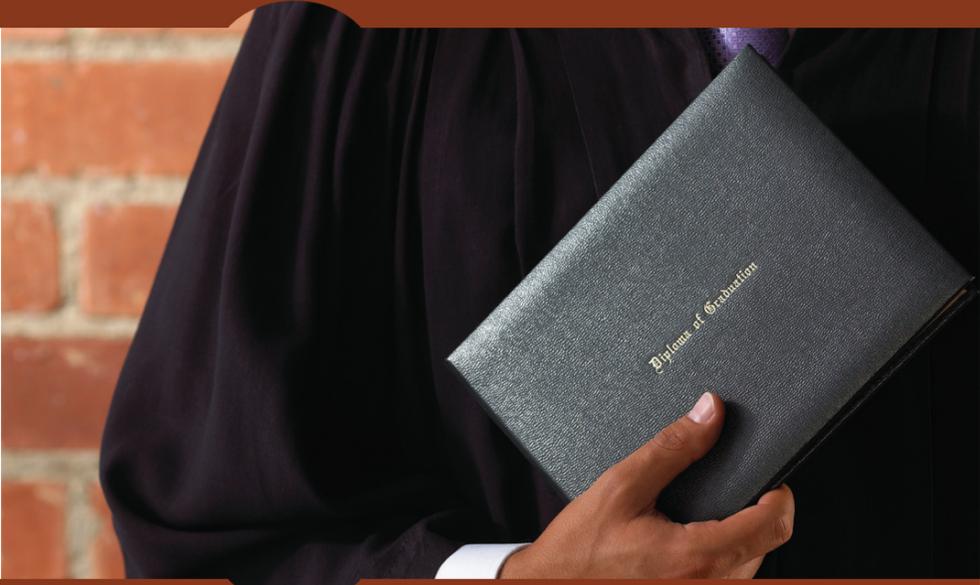
Graduating more students with degrees in science, technology, engineering, and math (STEM) is a competitive agenda item for academia and American society. Consider the statistics:

- Last year, China and India graduated 500,000 engineers and scientists compared to 60,000 from the U.S.
- The majors with the highest starting and mid career salaries are nearly all STEM degrees, according to PayScale.com College Salary Report.
- Job growth in science and technology in the U.S. is being met by foreign talent.

Combine those statistics with the fact that the minority population in the U.S. continues to grow, and you have a formula for opportunity: get more minorities interested in STEM degrees, and work to make sure they graduate successfully.

continued on page 5...

Left to right – Paul Villegas, director of the MEP; Andrew Malone (ME, '11); Oya Ross Walcott (ME, '11) and Perla Garcia (ME, '11)



Forbes Magazine Recognizes CSU, Chico for Success in Graduating Minorities in Science and Math

Researchers at *Forbes* magazine tackled the job of examining all 400 schools in their ranking of America's Best Colleges to determine which do the best job of graduating minorities in science, technology, engineering, and math (STEM). California State University, Chico made the top 20.

"I attribute much of the success in recruiting and graduating minority students in engineering, computer science, and construction management to our Math, Engineering, Science Achievement Program (MEP)," said Mike Ward, dean of the College of Engineering, Computer Science, and Construction Management. "MEP has been instrumental in recruiting good students, retaining them, and helping them graduate."

After excluding from the analysis those schools where the student body is almost entirely minority students, the researchers compared blacks, Hispanics, and American Indians – groups typically underrepresented in STEM – to whites and Asians, groups that are typically well represented in those areas of study.



"Of course we are proud of the distinction as a setting where minority students succeed," says Paul Villegas, director of the MEP at CSU, Chico. "But that's our business – to contribute to the economy and promote the success of our future leaders. Chico is a place where we want all our students to succeed."

CSU, Chico and Westmont College in Santa Barbara were the only two California schools that made the list.

continued from page 3...

"For our country to remain competitive, we need to tap into the minority population and cultivate them as home-grown talent in math, science, and engineering," says Paul Villegas, director of the Math, Engineering, Science Achievement Engineering Program (MEP) at CSU, Chico.

It may be a tall order for many universities, but CSU, Chico is succeeding where many other colleges and universities are not, and the MEP has a lot to do with that success.

"We are sharply focused on recruiting, retaining, and graduating minority students who are professionally prepared to take on the challenges in science, engineering and technology," says Villegas. See sidebar to learn how Villegas' program was instrumental to *Forbes* magazine's rating Chico among the top 20 schools to meet these goals.

MEP is a holistic endeavor that starts at the high school level and continues through college.

"This is a comprehensive recruitment and retention program that develops relationships with high school teachers and counselors, as well as community college advisors, in order to get the word out to students about the opportunities available to them," he says.

Those opportunities include scholarships. Over the last 10 years, financial support of over \$1.8 million has been offered to such students via National Science Foundation scholarships.

"Once a student gets to campus, we make sure he or she has community, is encouraged to develop study habits important to succeed in STEM majors, and gets the tutoring and academic support they need to succeed," Villegas says.

Miguel Arellano (CE, '06), virtualization analyst at Chevron's Information Technology Company, is quick to give credit to the MEP program for his success in school and in industry.

"I wanted to pursue a degree in computer engineering, and the MEP program was key to my success at CSU, Chico," Arellano says.

Arellano is typical of the students the program is designed to help, and his experience exemplifies the results that are achieved.

"As a first-generation college student, I was faced with multiple challenges," he explains. His first challenge was paying for school. Scholarships, including those from MEP, helped cover his expenses. Getting academic support to be successful in his studies was another area of concern.

"The resources that were available to me made the world of difference. I recall spending hours upon hours working on projects in the MEP center. If I hadn't had a place to study and get help with my class work I don't think that I would have been able to complete my engineering degree," he says.

Mentoring was also key to Arellano's ability to successfully bridge from college to work. "The MEP staff provided me a home-away-from-home, and with their help and motivation I was able to take on leadership roles and responsibilities that are extremely important in any industry."

Now considered one of Chevron's subject matter experts on virtualization, Arellano sees the benefit of adding more minority professionals in science, technology, engineering, and math to the mix in industry.

"Diverse talent and diverse cultures in the workplace mean a richer pool of creative minds to drive innovation and pursue new ways of thinking," he says. "That's what smart industries are already cultivating."

Making Shaky Ground an Entrepreneurial Foundation

What shook Dr. H. Kit Miyamoto's world as a child ended up defining his life's purpose.

"I grew up in Japan and California. Earthquakes were a part of my life," says Miyamoto, (CE, '89) CEO of world-renowned companies Miyamoto International and Global Risk Miyamoto. "I have seen too much suffering during my career and I know that technology is the solution to avoid all that."

Under Miyamoto's leadership, Miyamoto International and Global Risk Miyamoto have completed over 10,000 projects worldwide in high performance earthquake structural engineering.

"I love what we do. We add value, safety, and sustainability to communities worldwide," he says. "We make the world a better place."

By "we," Miyamoto refers to all his employees. Devastation in Haiti, New Zealand and China meant that leadership, including Miyamoto, were in the trenches with their employees responding to disaster where others feared to tread. "I saw tens of thousands of children die under collapsed school buildings in the 2008 Sichuan earthquake. We, as structural engineers, should and can do much better. Our mission is important," he says.

Perhaps his early experience with earthquakes makes Miyamoto singularly adept at being on-site immediately after a disaster. "It is definitely dangerous right after a disaster, but I feel at home at the disaster sites and in those accompanying confusing states," he says. "All my engineering knowledge, communication skills, cultural understanding, quick tactical decision-making skills, and physical fitness are put to the test at the sites."



Back when Miyamoto was an undergraduate at CSU Chico, he had a clear vision of his life today. "I have always believed that if I set out to accomplish something to benefit others, worked really hard at it, and was passionate about it, I would achieve it," he says. "I can tell you that without the experiences I had at Chico, I would not be a CEO today."

As an undergraduate, Miyamoto devoted himself as much to academic achievement as to campus involvement, including being a resident advisor, Delta Chi member, and a forest fire fighter. "Those outside classroom experiences may have been more important in the long run; especially as a resident advisor, I learned a lot about people, team work, and leadership."

That leadership experience underpins Miyamoto's mission, vision, and expectation for his companies today. "Our company culture is built on individuals who want to work as a team but who bring individual passion, communication skills, and technical ability. Working here is not for everyone, but we are a fit for one who is passionate about his or her goals and whose personal mission is to make the world a better place."

ABOUT H. KIT MIYAMOTO, PHD, SE (CE, '89)

- President and CEO of Miyamoto International and Global Risk Miyamoto
- Internationally recognized expert in earthquake structural engineering
- An American Society of Civil Engineers (ASCE) Fellow
- Served on many code writing organizations, including the ASCE 7 Seismic Task Committee
- Authored and published more than 100 technical papers on a variety of structural engineering topics
- Past adjunct professor at CSU, Chico
- Past director for the Structural Engineering Association of California (SEAOC)

Above: Responding in Haiti. Kit Miyamoto and his team provided damage assessment of 400,000 buildings in Haiti after the 2010 earthquake.

Right: Something to smile about. "We make the world a better place," says Miyamoto, pictured here with Haitian children.

Make the Connection

STUDENTS USE THEIR TALENT AND SKILL TO IMPACT
THE COMMUNITY AND THE WORLD.



CAMPUS CONNECTION

The first step toward adoption of clean renewable energy is to study feasibility. Six students in Professor Greg Kallio's Energy Systems course have completed such a study and have deemed two residence halls perfect opportunities for roof-top solar cogeneration solutions. They worked with Cogenra Solar of Mountain View, Calif. on devising the appropriate system design for the project and were advised by alum Brian Atchley (ME, '02), Cogenra engineering manager. The solution uses concentrated solar power that delivers grid-tied electricity and hot water to the dorms. The student team included Kendyl Brown, John Buss, Joey Buty, Justin Odell, Jamie Staton, and Ben Stevens – all mechanical engineering majors.



YOUTH CONNECTION

Eight Concrete Industry Management students will do concrete repair on Alcatraz Island this summer and mentor high school volunteer work groups in various locations within the Golden Gate National Recreation Area. The project partners with the National Parks Service, which has committed \$35,000 per year for each of the next five years in support of the program. Concrete industry partners are also supporting the project by contributing materials, equipment, additional funds for student stipends, and other needed resources.



COMMUNITY CONNECTION

The final two houses built for victims of domestic violence and their children have been completed in phase two of Blitz Build – a community service project led by advisors and students from the college. Supported by a \$250,000 loan from the Chico Redevelopment Agency, the effort brought together 130 volunteers; time and material donations from Associated General Contractors, West Valley Construction, and Milwaukee Tools; and industry advisory support from Conroy Construction, Modern Building Company, and Slater and Son Construction.



NATIONAL CONNECTION

Following on the success of a project in 2010 to create a memorial for the NYC Firefighters who lost their lives in the 9/11 tragedy, Concrete Industry Management students showed off their craftsmanship at the 2011 World of Concrete Conference in Las Vegas – and supplied one of the most creative items up for bid in the event's auction. During the conference students demonstrated their expertise with vertical concrete, staining, stamping, and other decorative techniques by creating an eight-foot-tall replica of the Alcatraz lighthouse. The model was later auctioned for more than \$400. Proceeds from the auction, which netted over \$500,000, will benefit the CIM programs at CSU, Chico, Middle Tennessee State University, Arizona State University, New Jersey Institute of Technology, and Texas State University, San Marcos.

Preparing to Battle Other Brains in IBM's International Collegiate Programming Contest

CONGRATULATIONS TO CSU, CHICO'S COMPUTER SCIENCE STUDENT TEAM THAT WON A PLACE IN THE INTERNATIONAL COLLEGIATE PROGRAMMING CONTEST. TEAM MEMBERS INCLUDE KATHERINE GABALES, ABHISHEK IYER AND DAVID STOLP AND THEIR COACH, PROFESSOR ABDEL-MOATY FAYEK.



With a last-second victory in November that qualified them to go to the world championship, CSU, Chico's computer science student team became one of 24 North America college teams to compete in the IBM-sponsored International Collegiate Programming Contest (ICPC) this summer.

Like in the regional contests CSU, Chico's WildCat1 team won, the world finals – known as the Battle of the Brains – will require three person teams to solve extremely difficult computer programming problems in a race against time and about 100 other teams. The contest is designed to foster creativity, teamwork, and innovation in building new software programs, and enables students to test their ability to perform under pressure.

“Computer Science students from CSU, Chico have participated in the contest since the first one took place in 1977,” says Orlando S. Madrigal, professor emeritus, Department of Computer Science.

Professor Madrigal is one of the founders of the contest, and is especially proud of the WildCat1 team's move to the world finals. “I am one of the six people from around the country who started this event in 1976. All six of us were members of the Executive Council of Upsilon Pi Epsilon, international honor society for the computing and information disciplines,” he says.

While the scope of the contest has grown over 35 years, the purpose remains the same, says Madrigal. “This event gives students great experiences in dealing with very complex and difficult programming problems, and an opportunity to mingle with the best of the best students in the computing field from all corners of the world.”

There is stiff competition and high expectation ahead for the team; in the last 12 years, no U.S. team has won the world finals. “The best students in the computing sciences participate in this event. Thus, our Chico team will be competing not only with the best students from North America, but they will also compete against students from the top schools in China, India, and Russia, just to name a few,” says Madrigal.

Team members Katherine Gabales, Abhishek Iyer, and David Stolp, along with their coach, Professor Abdel Moaty Fayek, chair of the Department of Computer Science, know who their toughest competition is, says Madrigal.

“In the past 10 years or so, the toughest competitors have been students from China (Shanghai Jiatong University, Beijing University, and Tsinghua University), students from Russia (St. Petersburg State University and Moscow State) and Poland (Warsaw University),” says Madrigal.

How is the team preparing for the oldest, largest, and most prestigious programming contest in the world? Weekly practice sessions on top of meeting their challenging course work, says Professor Fayek.

“It's a dream of mine to bring the world trophy back to CSU, Chico,” he says.

The ICPC World finals were originally scheduled to be held in Sharm el Sheik, Egypt during the last week in February, and CSU, Chico had made travel arrangements to travel to Egypt. Recent political problems there made it necessary for contest organizers to change the venue. The competition will be held on May 27–31 at the Peabody Hotel in Orlando, Florida.

Sustainable Manufacturing and the Case for Home-Grown Ingenuity

At first glance, a roll of old shag carpeting doesn't look too threatening. Neither does a 1980s-era TV or used up fluorescent bulbs. But a group of regional waste haulers considered these and other impossible-or hard-to-recycle materials a real problem. So, they turned to the students in CSU, Chico's Sustainable Manufacturing Program (SMP) with a challenge: figure out alternative uses, products, or methods to divert such items from the landfill.

"In conjunction with these companies, our students are looking for solutions that meet triple bottom line goals of value to society, the environment, and the economy," says Daren Otten, coordinator of the Sustainable Manufacturing Program. "It will be interesting to watch. These students are in a great place to provide significant value to industry and society and to possibly start businesses around these concepts."

That opportunity – and the SMP – defines a new age in manufacturing. No longer is the business of manufacturing solely focused on the metrics of a bottom line to the detriment of the environment and the global economy. Now, sustainable manufacturing aims to create products that stimulate the economy, and uses processes that are non-polluting, and conserve energy and natural resources. These procedures are economically sound and safe for employees, communities, and consumers.

Impacting business, environment, and society are the three goals of the program, which



integrates math, science, and technology with contemporary manufacturing processes and an inherent appreciation of global interconnectivity. It's a program of study where students learn to anticipate the implications of decisions and to evaluate options in a global context to minimize the impact of manufacturing activities on people, the environment, and resources, while understanding the underlying economics of producing goods. The program is a magnet for students in engineering majors, but also draws from other disciplines, including agriculture, business and environmental science.

The program's coherence of process, profit, and proficiency is a point of pride for Otten. "I'm much more of an industry guy than an academic. When I see skills develop and a student go on to bring value to an employer and in turn be fairly compensated for bringing that value, I am happy," he says.

Hands-on experience, like the project challenge from regional waste haulers, is typical of how students learn in the program, says Otten. "The eager young talent and our dedicated team believe that innovation can be fostered here. We know that, by looking at traditional



SMP Students Win Grand Prize in Manufacturing Challenge

A year long extracurricular activity has garnered a team of 12 Chico SME students the top prize in the Society of Manufacturing Engineers Manufacturing Challenge during the AeroDef Manufacturing Convention April 5.

The 12 students designed and manufactured the tooling and full production systems for a mountain bike chain guide and bash guard. The components and processes emphasized sustainability and include fully recycled plastic components, cardboard package inserts, and fully compostable plastic packaging.

The project was a huge time commitment for all of us, and we are all very proud of our work and pleased with the recognition, says Jason Teixeira (SME, '11), one of the team presenters.

The award winning entry marks CSU, Chico's eighth grand prize in the contest since the competition's start in 1986. The students competed against a field of 10 other universities and colleges, including California State Polytechnic University, Pomona; California Polytechnic State University, San Luis Obispo; and Northridge.

"Our students are looking for solutions that meet triple bottom line goals of value to society, the environment and the economy."

manufacturing processes differently, perceived challenges become opportunities."

Making opportunities, rather than waiting for opportunity to knock, is also part of the program. Opened last year, the Innovation Lab is a place where research, training, business mentoring, and development are encouraged, and where scalable enterprise with growth potential is the goal.

"The Innovation Lab is one way to help foster creative, exciting startup companies that can offer interesting challenges and maybe keep some of our best and brightest regional," says Otten.

The 21,600-square-foot lab is a state-recognized iHub, designed for business, community, and organizations to share and access industry knowledge. In addition to providing manufacturing space and test labs, the lab has student interns available to assist with research and development as well as manufacturing trials.

There are currently three companies in startup phase in the lab, two of which are university project spin-offs and one that is doing contract research. "The contract research is being conducted by a green plastic company working with one of our industrial supporters to capture and convert co-mingled e-waste plastic and produce a useable commodity. Once research is complete, the Lab will help them secure funding to build a production facility within the county," says Otten.

Faculty News

DINGXIN CHENG • CURT HASELTON • NICK REPANICH

DingXin Cheng, Associate Professor, Department of Civil Engineering, received the 2011 Professional Achievement Honor for Excellence in Teaching and Scholarship by the Office of Research and Sponsored Programs. Cheng has spent the last several years conducting research on pavement preservation processes, focusing on the use of recycled tire waste. He has taken this research and integrated it into his teaching and has presented his research at conferences, both nationally and internationally.

Curt Haselton, Chair, Department of Civil Engineering, has received the 2011 Professional Achievement Honor for Engineering Excellence, by the Office of Research and Sponsored Programs, for his participation in the FEMA P-695 project. His research in structural earthquake engineering has led to important advances in the ability to directly model the collapse of buildings shaken by earthquakes and has also led to advancement of the structural building code in the United States. Haselton currently leads two building code development teams, has an active National Science Foundation grant, and participates in several other research projects focused on both building code development and fundamental research.

Nick Repanich, Adjunct Professor, Department of Mechanical Engineering, Mechatronic Engineering, and Manufacturing Technology, received over \$480,000 from Lawrence Livermore National Security to design a robot platform and modify the existing prototype platform, to generalize controls of various robots into one common platform base, and to develop radio frequency identification reader robot design and implementation.

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SOLUTION SETTERS:

The College Advisory Board met recently to discuss a variety of topics and solutions to problem sets facing ECC in the coming days. They toured the National Ignition Facility – a \$4 billion laser accelerator designed to solve some of the most vexing scientific problems (like nuclear fusion).

From left are **Robert Alber** (guest), University Advancement; **Ben Juliano**, ECC Associate Dean; **Steve Gonsalves** (Board Chair), Nichols, Melburg, & Rossetto; **Gary Borders**, Hewlett Packard; **Andy Corzine**, Naval Air Warfare Center Weapons Division; **Alexis Strauss**, U.S. Environmental Protection Agency; **David McCallen**, Lawrence Livermore National Laboratories; **Mike Ward**, ECC Dean; **Jerry Hight**, ECC Assistant Dean; **Rob White**, City of Livermore; **Dana Davis**, Teichert Construction (not pictured, **Bob Linscheid**, CEP/CSU Trustees; **Peter Emmons**, Structural Group)

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For more information about getting involved with the college and gift planning, please contact:

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