

# CIVIL ENGINEERING AND CONSTRUCTION MANAGEMENT

*Gordon and Jill Bourns College of Engineering*



*2020 - 2021*

# MESSAGE FROM THE CHAIR

*Jong-Wha Bai, Ph.D., P.E.*

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I hope you enjoy this edition of our Civil Engineering and Construction Management (CECM) Newsletter. Despite all the challenges we faced during the pandemic due to the COVID-19, our faculty, staff,

and students promptly adapted to changes and overcame the difficult times together. During the year 2020-2021, all the lectures have been taught in a synchronous remote instruction mode while engineering labs were conducted in-person with safety gears. Even under these circumstances, both Civil Engineering and Construction Management programs were able to continue providing quality education to our students while keeping them safe.

There have been numerous exciting news for faculty and students. First of all, Brandon Wagner, a CM senior, received the MVP award at the ASC's Reno competition in February. The team competed in the preconstruction category, and this year was the second time to participate in the competition. In addition, several students received awards and recognition from professional organizations: Jessica Glenn (MSCE graduated in May 2020) and Valeria Villasenor (CE junior) received scholarships from the WTS International (\$5000 and \$4000, respectively); Gregory Wikoff (CE junior) received a scholarship of \$2500 from the APWA Inland Empire branch in November 2020; Victoria Bucy (CE sophomore) go the ASCE's 2021 Y.C. Yang Civil Engineering scholarship (\$3000) in April 2021.

Junior design projects and senior capstone projects were presented virtually during the College of Engineering Virtual Design Showcase this year. Additionally, our faculty members have actively participated in professional organizations through publications, presentations, and other research activities.

Since last summer, our students have participated in internships in public and private sectors such as Granite, Tilden-Coil, Tovey/Shultz, Kiewit, Kimley Horn, Rick Engineering, and Caltrans. I want to thank our industry partners for their valuable support, not only providing opportunities for our students but also donating funds and time to impact our students and programs, even under these challenging situations. In addition, three MSCE students, Mohammed Shaikh, Dhruv Patel, and Varun Patel, successfully defended their thesis/projects and graduated this year.

In closing, I extend our sincere thanks for your support on behalf of the faculty, staff, and students. I look forward to working together with you to continue to move our programs forward. I hope your continuous prayers and support for future events such as capstone projects, the preparation of ASC Reno competition and ASCE Pacific Southwest Conference (PSWC) next year, and continuous enhancement on both Civil Engineering and Construction Management programs.

Blessings,

Jong-Wha Bai, Ph.D., P.E.

Department Chair / Professor

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# FACULTY HIGHLIGHTS

## *Research Over the Years*



### **Dr. Jay Lee,**

Dr. Lee continued serving as a Program Evaluator (PEV) for Accreditation Board for Engineering and Technology (ABET) and received Excellent Service Recognition by Executive Director & CEO of ABET in January, 2020, for 2019 Review Period. Dr. Lee's primary research interests include information technology and strategic decision-making practices in various engineering management fields, spatial analysis utilizing commercial GIS applications, and machine learning-based forecasting in engineering practices. His recent scholarly work includes co-authoring "Forecasting Drought Indices Using Machine Learning Algorithm" which was presented in 2020 ASEE Annual Conference & Exposition, American Society for Engineering Education, Virtual Conference, June 21-24, 2020.

### **Dr. Jong-Wha Bai,**

Dr. Jong-Wha Bai attended the 2021 EERI (Earthquake Engineering Research Institute) Virtual Annual meeting and presented his research via zoom in March, 2021. During the year 2020-2021, Dr. Bai published a conference paper on seismic fragility analysis with one graduate student (Jessica Glenn) to the 17<sup>th</sup> World Conference on Earthquake Engineering. He also submitted papers on the Bayesian Network modeling to two international conferences (13<sup>th</sup> International Conference on Structural Safety and Reliability, and San Fernando Earthquake Conference). In 2020, he received a recognition from the KSCE (Korean Society of Civil Engineers) to his service as an Associate Editor (2016-2020).



### **Dr. Helen Jung,**

Dr. Jung is stepping down as an Associate Dean of College of Engineering after serving the college of engineering for last 7 years, total of 11 years of administrative role. Regarding the research area, she reviewed 15 National Science Foundation grant proposals of the graduate division. She also helped K-12 programs, leading the Metrology Science Olympiad group.



**Dr. Michael Nalbandian,**

Dr. Nalbandian's research interests revolve around environmental nanotechnology. He has 6 peer-reviewed publications concerning the use of fabricated chemically-active nanomaterials towards the removal of organic and heavy metal contaminants in aquatic systems. He supervises undergraduate students via EGR 101 and research projects on conducting preliminary electrospinning experiments. He is also an active reviewer for several peer-reviewed journals such as *Materials & Design*, *Water, Processes, and Applied Sciences*. He is currently working with colleagues in the University of Iowa and Notre Dame on a comprehensive review on the established work and the practical outlook of electrospun nanofiber membranes in water treatment systems.

**Dr. Yeeseock Kim,**

Dr. Kim has been managing a research grant from the National Institute of Health (NIH) as a PI, titled "Spatiotemporal Coordination of Actin Regulators and Traction Forces in Heterogeneous Cell Protrusions." Dr. Kim has developed an artificial intelligence model for predicting the complex behavior of cancer cells. Dr. Kim has served as an editor/associate editor of several journal articles: *Intelligent and Fuzzy Systems*; *Sensors*; and *Advances in Mechanical Engineering*. In 2020, Dr. Kim published 3 peer reviewed journal articles in the areas of artificial intelligence and machine learning .



**Dr. Fred Pontius,**

Dr. Pontius' research focus is the treatment water and wastewater. Ongoing coagulation studies were performed this year on Lake Evans. Water treatment equipment was constructed students used for a settling tank residence time experiment and an experiment using granular activated carbon cartridge filtration to remove residual chlorine from water. Dr. Pontius advised a Civil Engineering capstone team to construct and operate a pilot-scale water treatment system using cartridge filtration, activated carbon, and hollow-fiber microfiltration. Dr. Pontius coauthored a paper published in *Chemosphere*: "Two new predictors combined with quantum chemical parameters for the selection of oxidants and degradation of organic contaminants."

# FACULTY SPOTLIGHT

## *Special Achievements*

(Left to Right, Top to Bottom)  
Bryce Erickson (husband of my daughter Elizabeth), David Pontius (youngest son), John Pontius (oldest son), Elizabeth Erickson (daughter), Dr. Pontius, Nancy Pontius (Wife)



Dr. Pontius and his wife enjoyed traveling and visiting their international student friends. For several years before the pandemic, they traveled to China many times.

Dr. Pontius earned a Ph.D. in civil engineering in 2007 and joined CBU in 2010. His doctoral research focused on virus rejection by microfiltration. From 1978 to 2010, he worked in industry, including ten years self-employed as an S-Corporation. While at CBU, Dr. Pontius has created five undergraduate and two graduate courses in civil and environmental engineering. He set up and managed the CBU Environmental Engineering Laboratory. His research focus is water and wastewater treatment, infrastructure and climate changes, and membrane treatment. He constructed pilot-scale systems for several unit processes: coagulation, flocculation, sedimentation, sand filtration, microfiltration, ultrafiltration, chlorination, UV disinfection, and desalination. He has developed a spec-

trophotometric method for detecting acetylsalicylic acid (aspirin) in water. Dr. Pontius's publications include microfiltration membrane integrity and virus rejection, evaluation of coagulants including chitosan to remove algae, upgrading small water systems to control trihalomethanes and halo acetic acids. Dr. Pontius has evaluated surface temperature data for cities in four countries and published the analysis in water, "Sustainable Infrastructure: Climate Changes and Carbon Dioxide." He was a guest editor for a special issue on water, "Emerging Contaminants in Water: Detection, Treatment, and Regulation." Dr. Pontius has recently been appointed to the Water Topics Board of Editors.

- Dr. Fred Pontius

# CBU AEC Club Activities

## *ASC Reno Student Competition Goes Virtual*

This year ASC competition was different than any other year. The competition was held through Zoom Meetings, but that did not stop the team, which consisted of Johnathan Toews, Michael Cornejo, Oscar Zuniga, Jeser Chavez, Emily Mitra, Brandon Wagoner, and Ivan Hinojosa, from accomplishing the project. The team was under the pre-construction division, and they were given plans in early January. They had to turn in their estimates by the beginning of February, and then the competition began later on during the third week. Many companies sponsor the different categories of changes and provide plans during this event. "You are given changes, and the competition is to see how well you can estimate, how close you can get to it, and how well you practice the teamwork when it comes to addendums," said Oscar Zuniga. During the event, you have to create deliverables and turn them in on a tight schedule, just like the real-world construction companies. The newest challenge added to this competition was it being virtual. "We encour-

tered some new challenges that did not happen in the previous years. We had to figure out how we were going to coordinate with myself and other team members, like how we were going to distribute the work as well as having to present virtually," said Toews. When it came to the presentation, not only did the team have to focus on what they were saying, but they also had to make sure they look professional through the screen. After all of the work is turned in and presented, the judges select the top three schools based on point value from what was given. "I love doing the ASC competition, and I think it's one of the best ways for construction management students to be able to showcase their talents and what they have learned," said Toews. The club teaches students new things which allow them to carry them with them to new jobs. "This competition was how I got my internship," said Zuniga. He will be working for the company after graduation.

- Oscar Zuniga and Johnathan David Toews



# STUDENT SPOTLIGHT: Civil Engineering

## *Elisa Marie Castro*



Recent graduate Elisa Marie Castro studied in Civil Engineering at CBU. She chose civil engineering because she was into math, science, and overall stem in general. She had friends that were heading into engineering, which motivated her because they had similar interests. Her grandpa and uncle are also engineers in her family, which influenced her. "I did civil engineering specifically because the classes seemed the most interesting, and it worked out well," said Castro. She also loves the satisfaction of problem-solving and the diversity of branches under civil engineering. She believes there are a lot of options to choose from to which one is not limited.

While studying at CBU, her favorite class was Principals of Environmental Engineering and Science. "It was fun. Dr. Nalbandian was the professor, and he kept things interesting and threw in pop culture references," she said. Besides the class, her favorite project she has worked on was the

capstone project she designed. Her team made a concert hall designed for the CBU campus.

After graduation, she will be working for Atkinson Construction. She interned for them in the summer of 2020 in which she enjoyed. "I worked with some amazing people, and the work was never the same day in day out. It was interesting, and that is what made me want to keep working with them after graduation," said Castro. Since it was during the time of COVID, she was limited to the events they would usually have for interns and the gatherings, but it did not stop her from enjoying the work.

Aside from her classes and internship, Castro got to have her senior recital playing the violin. "It was nice to have the last performance during school so I can share what I had learned and the music with them," said Castro.

# STUDENT SPOTLIGHT: Construction Management

## *Brandon Wagoner*



Recent graduate Brandon Wagoner studied in Construction Management at CBU. He was motivated by his family but mainly his father because he is a contractor who owns a small business in Orange Country. He believes that is what set him on his path.

Besides spending his days studying and going to classes during his days at CBU, Wagoner was a part of the AEC club in which he participated in the ASC Reno competition. He was a part of the capstone project in which six different schools competed against each other over Zoom Meetings due to the pandemic. This competition was his second time competing. Wagoner said, "The competition was my first outside of the classroom experience as a real-world

experience in the major. I felt overwhelmed, but I had seniors on the team who had internship experience and were able to pass their knowledge on." He said his experience from competing in 2020 allowed him to carry on what he learned into the competition of 2021. He was awarded the MVP of the Reno Competition in his section after the schools were ranked.

Outside of CBU, during the summer of 2020, Wagoner did an internship for The Whiting-Turner Contracting Company. With them, he took on the role of being a project engineer. "It helps kind of shape you like in class. We learn a lot of academic stuff but then putting that into application in the real world is so much different," said Wagoner. He believes it was a unique experience that is helpful. "Three months of experience over the summer could be, I think, equivalent to like a whole semester of learning just because it is so practical," Wagoner explained. Right after graduation, he had a job at this company waiting for him.

# ASCE's Design Showcase

## Our Own Presentation

Due to the COVID, a lot of things were canceled this school year. For the ASCE club, PSWC was one of them. It is the main competition in which the team builds a concrete canoe, geotechnical wall, and a steel bridge. Each competition has different requirements and rules for competing in which the ASCE club has participated in previous years. Unfortunately, due to the COVID and the short amount of time, the club decided to withdraw. Instead, the club decided to focus on research and design for the steel bridge and concrete canoe in which they would have a showcase at the end of the semester.

During the semester, the two junior projects were split into two classes which was

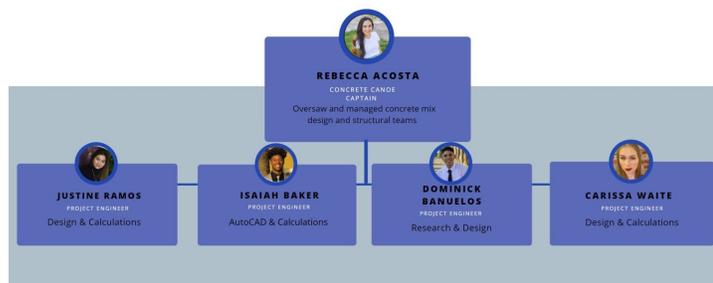
the first time CBU has done. It was done virtually and was not easy. Despite the unusual circumstances, the team worked together to get their projects done through Zoom. "The most challenging aspect that all groups faced was completing these projects virtually through zoom when in the past they have been very interactive and require in-person lab testing, development, and construction.," said Rebecca Acosta and Josh Henson.

- Rebecca Acosta and Josh Henson

## Concrete Canoe 2021

Structural Team

Responsible for the canoe's hull geometry and design, structural calculations, and construction drawings.



## Construction Team



John Paul Matining



Marcus Nguyen



Princewill O' Maduekwe

## Mix Design and Materials Team



Valeria Villasenor



Brittany Helfrich



Austin Aukerman



Luis Aguirre



Nathan Shea

# ACADEMIC SUCCESSES

## 2021 Capstone Design Projects

We are excited to celebrate the completion of our Senior Capstone Design Projects for 2020-2021. Each project represents the culmination of research, development and testing of unique solution to a design challenge in the two-course Senior Capstone Design sequence.

- Dr. Anthony Donaldson

## CAPSTONE



**Microfiltration Treatment of Lake Evans for Potable Water Use** - Jordan Chu, Elle Lowe, Misha Johnson, and Nathaniel Lloyd

**Sand Lane Development** - Josiah Salgado, Jesus Zuniga, Jessie Garcia, and Daniel Orona



**Environmental Retrofitting of the CBU Study Area** - Raymond Curran, Johnathan McGinn, Travis Moffat, Michael Eschen



# ACADEMIC SUCCESSES

## 2021 Capstone Design Projects



**Gage Canal GIS Mapping** - Lindsey Blake, Antonio Cendejas, Mark Hamiter, and Greg Wikoff



**Riverbed Foundation Design for a new Warehouse** - Joshua Walters, Caleb Howe, Nolan Stephan, and Owen Sudds



**Northwater Dam Powerhouse** - Johnathan Toews, Oscar Zuniga, Brandon Wagoner, Jeser Chavez, and Ivan Hinojosa



**Pedestrian Bridge across Adams Street** - Sean Denison, Stone Cyrus, Lane Matteson, and Michael Reyes



**CBU Music Hall** - Kalen Gopperton, Elisa Castro, Isabella Rhodes, Sahil Sharma, and Justine Ramos

**Master Drainage Plan for CBU Campus** - Robert Robinson, Nathan Tucker, and Luiz Valdez



# ACADEMIC SUCCESSES

## *2021 Graduation Ceremony*



### **Outstanding Student Award**

Ivan Hinojosa, Construction Management



### **Outstanding Student Award**

Elisa Marie Castro, Civil Engineering



### **Outstanding Student Award**

Kalen Gopperton, Civil Engineering

## Want to be featured in the next issue?



Have you or someone you know achieved a recent professional success? We want to hear from you! CBU Civil Engineering

and Construction Management is looking to feature the many accomplishments of our Civil Engineering and Construction Management Department.

Please send your short article (200-500 words) to [jbai@calbaptist.edu](mailto:jbai@calbaptist.edu).

## Upcoming Events:

May, 2021—CBU Spring 2021 Commencement

September, 2021 — CBU Engineering Fair

November, 2021 — CECM Industry Advisory Council meeting

December, 2021 — CBU Fall 2021 Commencement

February 9-12, 2022 — ASC Regions 6 & 7 Student Competition at Nugget Casino Resort, Sparks, NV

April, 2022 — Pacific Southwest Conference (PSWC)

## MAKE A GIFT

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Email \_\_\_\_\_

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# CBU

GORDON AND JILL BOURNS

# College of Engineering

## CIVIL ENGINEERING AND CONSTRUCTION MANAGEMENT



From left, Jong-Wha Bai, Larry Clement, Helen Jung, Anthony Donaldson, Wes Blasjo, Phil van Haaster, Liya Grace Ni, Jay Lee, and Mark Anklam

### *Credits*

#### Publication Supervisor

Jay Lee, Ph.D., P.E.

#### Contributing Writers

Gabriela Rodriguez, CE Major

Jay Lee, Ph.D., P.E.

Jong-Wha Bai, Ph.D., P.E.

#### Graphic Designer & Editor

Gabriela Rodriguez, CE Major

#### Contributing Photographers

Elisa Marie Castro, Brandon Wagoner,  
Rebecca Acosta, Fred Pontius, Jay Lee



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