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Chair's Message

Berit Givens

Congratulations to all on finishing another school year! As the year draws to a close, I am amazed at how much our faculty, staff, and students have accomplished. This is a time of enormous change for Cal Poly Pomona, with semester conversion and the elimination of developmental math and English. I am so happy with how everyone has pitched in to work together.

With semester conversion, the Department has made major changes to its curriculum for the first time in many years. Next year, the core will have changed in some fundamental ways – much more linear algebra is required, while a little less algebra and real analysis will be included in the core. Students will be learning to use mathematical software, like MatLab, instead of learning C++. We've also adjusted prerequisites for courses that were definitely overdue for such changes. For example, the new prerequisites for MAT 4190 (MAT 419) will include MAT 3100 (MAT 310), which just about any student who has taken MAT 419 agrees is a good idea! We've also made the Euclidean Geometry course (MAT 3300/MAT 330) a prerequisite for the non-Euclidean Geometry course (MAT 3310/MAT 415 or 416), so that all the students in the non-Euclidean course will have the same background in geometry. I'm sure that as we move into semesters, we will discover little glitches or unforeseen issues, but for the most part, I'm really excited and happy about the changes we chose to make.

This year we had three retirements: Dr. Patricia Hale retired in December, but will be coming back to teach in the FERP program starting next spring. Professors Youri Agvanian and Frank Barro both retired as well, after many years of service to the Department. They will be missed!

The Department also successfully hired two new tenure-track faculty in mathematics education, who will be starting next fall. Cristina Runnalls is moving here from Iowa. She specializes in research on mathematics education for English language learners. Anne Cawley is completing her PhD in Michigan, and she studies developmental mathematics education at the community college level.

I hope everyone has a good summer, and I look forward to seeing many of you next fall. To the graduating seniors, congratulations, and I hope you keep in touch. Thanks to all for another fun year in the Math & Stats Department.

Cal Poly Pomona DataFest Team Wins Top Prize

Adam King



The last weekend in April, over 100 undergraduate students from top Southern California universities including UCSD, UCI, and USC gathered at Chapman University to compete in the American Statistical Association's DataFest Competition. This annual event involves teams of 2-5 students working furiously over a 48-hour period (often even sleeping on-site at the host university location) to analyze a real dataset supplied by an industry sponsor; the event is simultaneously hosted at dozens of cities throughout the country. This year, the jobs website Indeed supplied data consisting of 14.5 million job postings, with an open-ended challenge to identify trends related to different job categories represented in the sample.

While such a large, complex data set would intimidate many undergraduate students, Cal Poly Pomona's team "Seems Logit" (a play on the stat term "logit") was not fazed. The team consisted of an interdisciplinary group of majors from across campus: Daniel Alley (Graphic Design), Christopher "Ren" Buglino (English and Math/Stat double), Brendon Chau (Industrial Engineering), Shunto Kobayashi (Economics and Math/Stat double), and Chon in "Dave" Luk (Computer Science and Math/Stat double). Over the course of the weekend, the team han-

dled tasks ranging from data wrangling (handling extensive missing data, linking to external U.S. Census Bureau data) to application of advanced modeling techniques such as Support Vector Machines, Neural Networks, and Random Forests.

Challenges the team faced included working with a rich/messy "Big Data" set, coordinating work across a group of five people (including sharing of code), and dealing with the exhaustion of the weekend-long data analysis marathon. In the end though, their hard work (and sometimes painful sleeping locations) paid off: After delivering their final presentation Sunday afternoon, they were awarded the top prize for Data Visualization, for among other things producing a beautiful graphic illustrating the distribution of several popular job types throughout the United States. They cite not only the overall strength of their team (consisting of some of Cal Poly Pomona's top talent from across campus), but also the individual skills each brought to the table (e.g., Daniel produced impressive custom graphics, while Ren finely tuned the script of their presentation). Clearly, the team's strong performance perfectly illustrates our University's "learn-by-doing" and "polytechnic" mottos. And we wish them congratulations!



2018-2019 Scholarship Awards

Jill Cannons

The scholarship committee is happy to announce the recipients of the math and stats scholarships for the 2018-2019 academic year:

John and Rosetrina Flaig Mathematics Scholarship Recipients:

Giao (Selena) Bui
Ruben Hurtado
Huyen Le

Stuart Friedman Memorial Scholarship Recipient:

Huyen Le

Armando Gallegos Mathematics Endowed Scholarship Recipient:

Ji Eun (Jean) Kim

Samuel Gendelman Memorial Scholarship Recipient:

Esteban Escobar

Dr. Emil R. Herzog Department Scholarship Recipients:

Alexis Ayala
Courtney Ball

Mr. and Mrs. Keith Soon Kim Mathematics and Science Scholarship Recipients:

Rui Hayashi
Jeffrey Yeh

Kenneth B. Kriege Mathematics Department Scholarship Recipient:

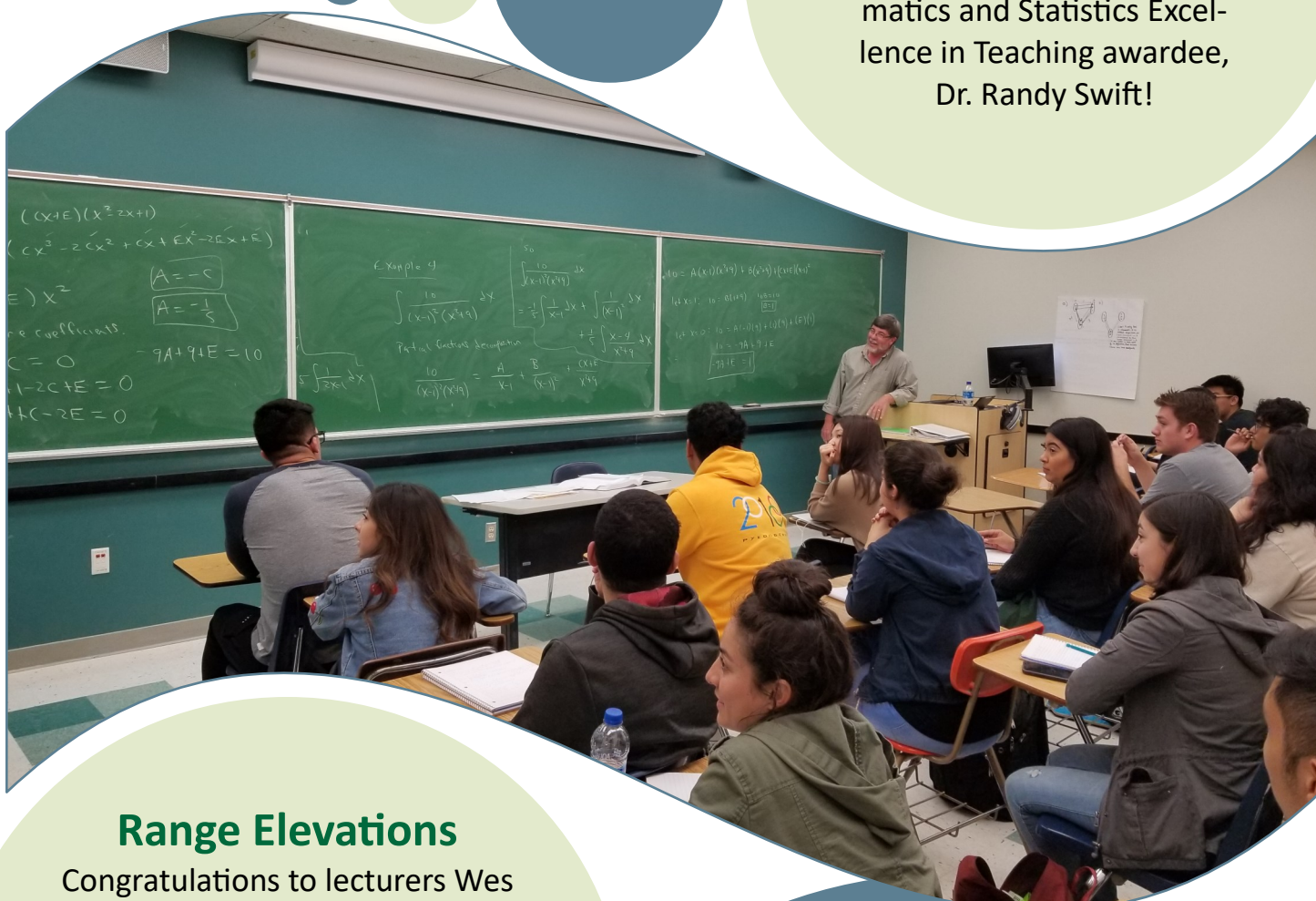
Jeremy Lin

Congratulations to the recipients for their success both in receiving an award and in their academic endeavors!

We wish to say thank you to all who took the time to prepare applications or write letters of recommendation, and to the donors and their families for their continued support of our students.

Excellence in Teaching Award

Join us in congratulating this year's Department of Mathematics and Statistics Excellence in Teaching awardee, Dr. Randy Swift!



Range Elevations

Congratulations to lecturers Wes Griffith, Tracy McDonald, Ben Miller, Jill Shirley and Karen Vaughn for receiving range elevations. We are extremely happy that the university recognizes their substantial contributions to the department and the broader CPP community.

Retirements

We acknowledge three retirements from the Cal Poly Pomona faculty:

Professor Patricia Hale

Lecturer Youri Agvanian

Full-time Lecturer Frank Barro (who spent 46 years combined at CPP as student and lecturer!)

Math Culture, Literacy, and Access

Robin Wilson



This year while on Sabbatical at Pomona College, in addition to working on a research project in spatial graph theory I also had a chance to spend time reading some of the current literature related to the issue of Equity in Mathematics Education. Much of the material in the body of work in this area is related to Mathematics Education at the High School level, but I found that much of it was immediately relevant to the fields of Undergraduate (and even Graduate) Mathematics Education as well. Upon returning from my Sabbatical, this Winter Quarter I offered a 2 unit course called Math Literacy, Culture, and Access. The students enjoyed the class enough to want to do it again in Spring, so the class ran in Spring Quarter as well. The class met once a week for two hours and over the two quarters we read and discussed a total of 25 articles related to issues of culture, gender, race, class, and identity in the mathematics classroom and mathematics community.

These readings and the discussions that followed were quite timely given the increase in awareness around equity and inclusion in our national conversation. Over the 20 weeks the students and I built a classroom community that provided a space for us to navigate the struggles we face as both students and teachers of mathematics in that often go unspoken. The community also provided a way to make connections with the politics of our historical moment around immigration, racism, gender equity, neo-liberalism, what is taking place in our mathematics classrooms, and how mathematics is used in society. The class also served as a place where we were able to learn about the potential for mathematics as a transformative tool for society, and the pitfalls of a mathematically uninformed population. There are not many opportunities to talk about these issues in the mathematics content courses that most departments offer, so this seminar style course

provided an opportunity for these conversations about the role mathematics plays in the marginalization of individuals, certain groups, and maintenance of the status quo. Overall, we all learned a tremendous amount in a short time about ourselves and our discipline, and many of us felt that the experience would be valuable for all mathematics students and teachers regardless of race, ethnicity, or gender.

- *What is ethnomathematics and what is its place in the teaching of mathematics in today's schools?*
- *Is mathematics teaching political and why do mathematics teachers need political knowledge?*
- *How does the culture of the modern mathematics classroom act as a "culture of exclusion"?*
- *How are mathematics identities of students racialized and what are the consequences of this for mathematics teaching and learning?*
- *What is the myth of the model minority and how do these stereotypes play out for mathematics students?*
- *What role does gender bias play in the mathematics classroom and how do we challenge these narratives?*



Gift of Numbers

Greisy Winicki-Landman

Like every quarter, the capstone-course students were invited to run the Gift of Numbers event at a Pomona school. This time it was Garey High School, where our alumnus – Mr. Marco Sanchez – is the principal. We had more than 200 students and some of them are planning to become Broncos. Cal Poly students ran about 20 stations, the majority of them dealing for games and puzzles. It was a great experience for these future teachers.

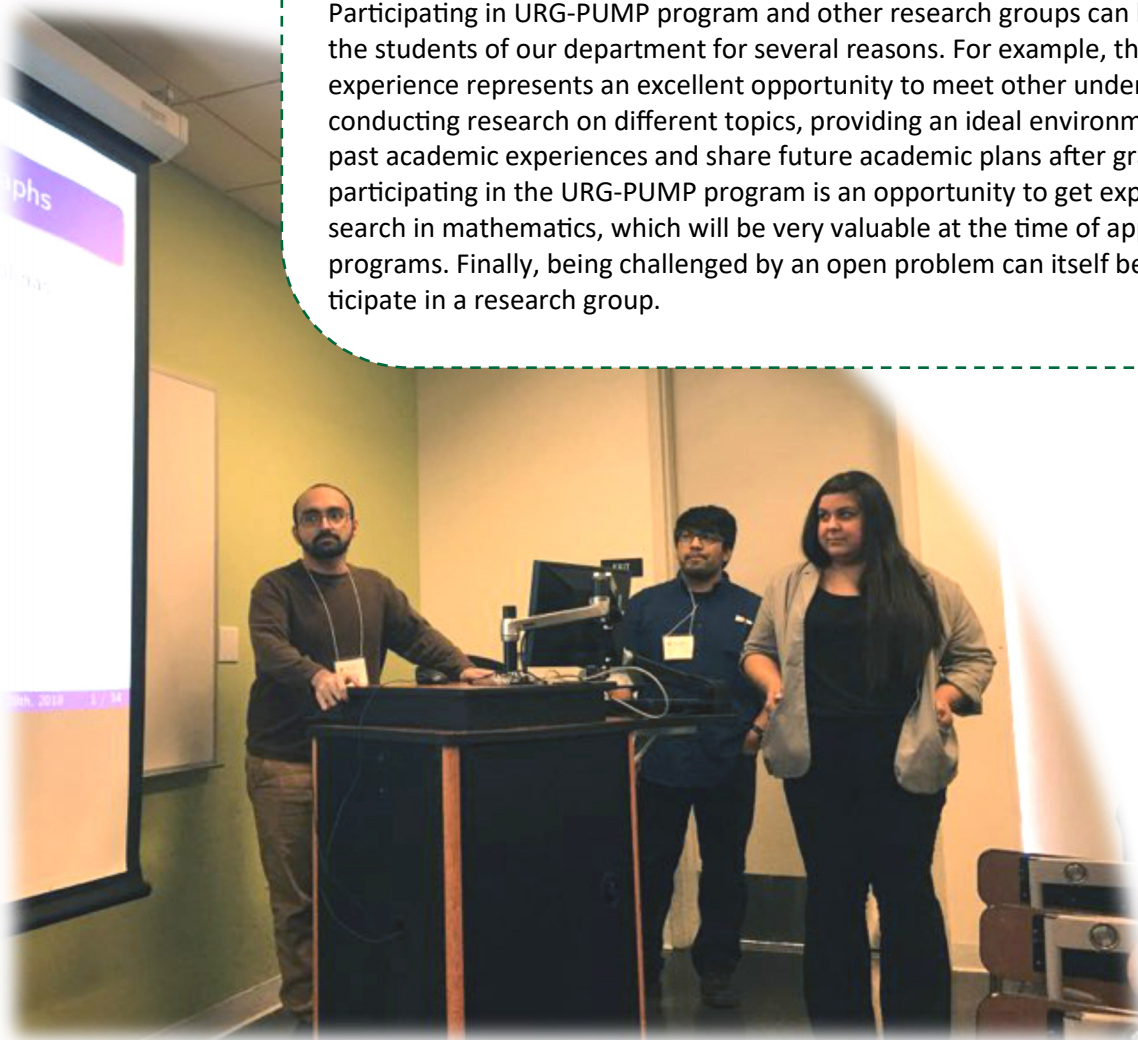
PUMP Undergraduate Research

Fernando López-García

PUMP (Preparing Undergraduates through Mentoring toward Ph.D.'s) is a program directed by Dr. M. Helena Noronha from Cal State Northridge and funded by a National Science Foundation grant. The goal of the PUMP program is to identify mathematical talent among minority students, women, and first-generation college students in the California State Universities located in Southern California and to strengthen the preparation of participating undergraduates to successfully pursue doctoral studies in a research institution.

Several professors and students of our Department of Mathematics and Statistics participated in PUMP's Undergraduate Research Group (URG-PUMP) in the past. This year twenty-six students from several Cal State Universities, including five students from CPP, participated in URG-PUMP. Rachel Anne Gray, David Krbachian, and Juan Jose Salinas, worked on a research project titled *The Laplacian Operator on Countable Graphs* under the supervision of Dr. Ivan Ventura. Selena Bui and Van Tran, conducted research on *An application of the weighted discrete Hardy inequality* under the supervision of Dr. Fernando López-García. Throughout the year the students worked on these topics and had periodic meetings with their advisors. At the end of the academic year, the students presented their work at the PUMP Research Symposium held at Cal State Northridge on April 28 in a joint meeting with the Pacific Math Alliance.

Participating in URG-PUMP program and other research groups can be highly beneficial to the students of our department for several reasons. For example, this type of research experience represents an excellent opportunity to meet other undergraduate students conducting research on different topics, providing an ideal environment to learn about past academic experiences and share future academic plans after graduation. Additionally, participating in the URG-PUMP program is an opportunity to get experience in doing research in mathematics, which will be very valuable at the time of applying to graduate programs. Finally, being challenged by an open problem can itself be a motivation to participate in a research group.





Photograph taken after student presentation at Chapman University, Fall 2017. Left to right: Dr. Mits Kobayashi, Dr. Alan Krinik, Chon In (Dave) Luk, Lyheng Phey, Jeffrey Yeh, Uyen Nguyen, and Samuel Lyche. Not pictured: Luis Cervantes and Tanner Thomas.

Ongoing Success

Alan Krinik

Students in my Cal Poly Pomona Research Group on Markov Chains and Processes have co-authored eleven talks. Many of these talks have been mentioned in past newsletters, but we wish to highlight our most recent presentations from this May:

Lattice Paths of an Alternating Birth-Death Chain Traveling from State i to State j Within a Strip; by Ly Phey*, Yoseph Dawit*, Jeffrey Yeh, Chon In (Dave) Luk, Jonathan Cohen, Uyen Nguyen, Christine Hoogendyk; Society for Industrial and Applied Mathematics (SIAM) 4th Annual Student Research Conference, Cal Poly Pomona, May 19, 2018.

Determining the probability of all lattice sample paths of an alternating birth-death chain traveling from state i to state j within a strip; by Chon In (Dave) Luk*, Yoseph Dawit*, Tanner J. Thomas, John Kath and David Perez; American Mathematical Society Math Connections, University of California, Riverside, 4:30-5, May 19, 2018.

Our research group usually meets on Friday afternoons, and continues to grow! Regularly attending members are: Mark Dela, Malachi C. Demmin, John Kath, Chon (Dave) In Luk, Samuel R. Lyche, Uyen Nguyen (Winwin), Ali Oudich, Ly H. Phey, Tanner J. Thomas, Jeffrey Yeh; new members include: Noah J. Chung, Jonathan L. Cohen, Yoseph Dawit, C. Hoogendyk, Quynh T. Le, Steven L. Marquez, David Perez, Anthony J. Piston and Stephen J. Shu.

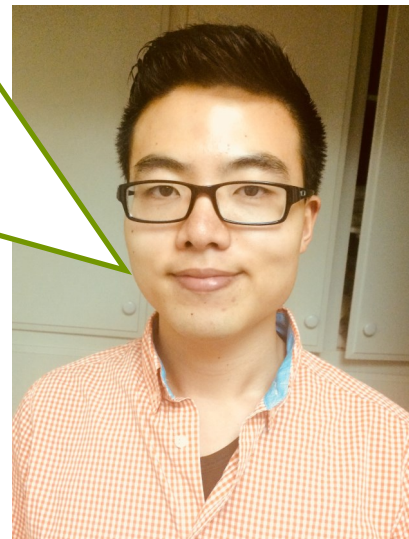
Commencement 2018

The College of Science Graduation Ceremony is **June 9, 2018 at 3:00 PM** on the University Quad. We caught up with the 2018 College of Science Valedictorian and Department of Math & Stats Banner Carriers to ask them a couple questions about their favorite CPP memories and plans for the future!

My favorite memory of being a math major at CPP is winning an award as a team at ASA DataFest 2018 at Chapman University. Since we put a lot of effort into our project, I felt very fulfilled when we received the award. Also, I really enjoyed working with my team members (Brendon Chau, Ren Buglino, David Luk, and Daniel Aley), who inspired me with their perseverance and unique skills. I loved being a math major at CPP since the department encourages us to engage in this kind of opportunity.

My plan after graduation relates to the fact that I have a double major in Applied Mathematics and Economics. Caltech accepted me for their PhD program in Economics, so I am going to attend there starting this fall. I want to study how individuals make decisions that collectively produce an overall outcome in a market or strategic game. Economics uses advanced math for theoretical models and statistics for empirical analyses, so I believe that the knowledge and experience I obtained as a math major will support my academic journey at Caltech.

—*Shunto Kobayashi, 2018 College of Science Valedictorian*



One of the best memories for me is spending time with professors during office hours to ask questions about math or to do research. Thanks to professors, I had fun studying math and felt the beauty of it. I have had many, many memories, which I cannot write everything down here.

I am going to pursue a master's degree at CPP. I am excited to see what my future will hold.

—*Rui Hayashi, 2018 Math and Stats Banner Carrier*



My favorite memory of being a math major at CPP is hanging out in the Green room. I would be doing homework, a project or just chatting about silly things with other friends in there. It is those times that make me feel like we are commiserating over work or celebrating in the Green room.

I am planning to go to work after graduation for the most part, but there is a chance that I might attend the grad program at CPP.

—*Chon In (Dave) Luk, 2018 Math and Stats Banner Carrier*