Professor Aldous starts a New Chapter: Retirement

Written by: Professor Jim Pitman Photo courtesy of: Professor <u>George</u> Bergman

avid Aldous, one of our most distinguished senior professors, retired from full service in the Department in July 2018. He will continue to be involved in the Department as Professor Emeritus and Professor in the Graduate School.

David was first appointed in Berkeley as an Assistant Professor in 1979, after studying mathematics as an undergraduate at St. John's College, Cambridge and receiving his Ph. D. in Mathematics from Cambridge University in 1977, where he worked under the supervision of David Garling and Geoff Eagleson. He was promoted to Associate Professor in 1982, and to Full Professor in 1986.

David's first research work concerned a subsequence principle for transferring limit theorems for independent and identically distributed random variables to suitable subsequences of an arbitrarily distributed sequence of random variables. This study led to David's long term interest in exchangeability and related topics.

One of his most celebrated early works is his 1981 generalization of de Finetti's theorem to partially exchangeable arrays of random variables. This result, obtained independently around the same time by Douglas Hoover, is now commonly known as the Aldous-Hoover theorem. David's 1983 survey on exchangeability and related topics laid the foundation for two decades of further research into various stochastic processes whose analysis was facilitated by ideas of exchangeability. These processes included various kinds of random partitions, random trees, and partition-valued and tree-valued stochastic processes. Another of David's interests dating back to



Image of continuum random forest tree

Cambridge days was the theory of weak convergence as a framework for comprehending the large scale asymptotic theory of various random processes. Combined with ideas of exchangeability, this led David in the 1990's to systematically develop the idea of studying large finite random structures by constructing a suitable infinite random structure which encapsulates the asymptotic behavior of the large finite structures as their size tends to infinity.

An exemplar of this paradigm is his now famous theory of continuum random trees as weak limits of various combinatorially

defined random trees. The Brownian continuum tree, which (via an insight from Le Gall) he showed could be constructed in a completely different way from the excursions of a Brownian path, is an especially important instance of this theory. David's series of three papers on this topic were highly influential in following developments of the theory of Markovian super processes and the Brownian map by Le Gall, Miermont and others.

David's research also made a deep impression in several other areas of probability theory: rates of convergence to equilibrium in finite-state Markov chains, Poisson approximations in diverse contexts, probabilistic analysis of algorithms, and the analysis of coalescent processes and spatial random networks.

David's research achievements have been recognized in an array of the highest honors.

In 1980 he was awarded the Rollo Davidson prize. In 1993 he was the first recipient of The Line and Michel Loève International Prize in Probability, created in honor of Michel Loève by his widow Line. This prize, awarded every two years, recognizes outstanding contributions by researchers in mathematical probability who are under 45 years old. More recently, David has been responsible for the continuing administration of the Loève Prize. In 1994 David was made a Fellow of the Royal Society, and in 1998 he was an invited speaker at the International Congress of Mathematicians. More recently, he became a Fellow of the American Academy of Arts and Sciences in 2004, and a foreign



Professor Aldous with alums, Lea Popovic, Shankar Bhamidi, and Jose Palacios

associate of the National Academy of Sciences in 2010. He has also been the recipient of a number of honorary degrees and guest professorships.

On the administrative side, David served as Department Chair from 1997 to 1999, and as the chair of key departmental committees including the personnel and graduate committees. He also did substantial service to the profession as an associate editor of various probability journals, and as the founding editor of Probability Surveys, an open access journal for review articles in probability theory.

David played a central role in the department's Ph.D. program in probability. Over the course of his career he gave specialized courses on a large number of research topics. He was the advisor of 13 Ph.D. students and many post doctoral fellows. Among his students who went on to academic careers were Lea Popovic, Vlada Limic, Antar Bandyopadhyay, José Palacios and Shankar Bhamidi. David also contributed greatly to the social life of the department's probability group. Particularly memorable were the many holiday parties at his home on Alameda island, the biannual dinners in celebration of the Loeve prize, and the weekly lunches of his group of students and postdocs on the north side of campus.

At the undergraduate level, David developed the innovative course STAT 157 ``Probability and the Real World"... **Story cont. on page 19**

Berkeley Statistics

NEW Faculty

Shirshendu Ganguly

joined Berkeley Statistics as a faculty member in July 2018 after spending two years as a Miller Fellow in the Statistics and Mathematics departments. Prior to that he obtained his PhD in Mathematics from University of Washington in 2016. He is interested in a wide range of problems in probability theory, statistical physics and related areas including Geometry of Polymers and other aspects of Disordered Environments, Phase Transitions in models of Self Organized Criticality, Study of Sparse Combinatorial Structures, Markov chains and Random walks.



Faculty AWARDS

Ben Brown:

- Intercampus Research Award, CZ Biohub. 2018

Peng Ding:

- Guy Medal in Bronze, Royal Statistical Society, United Kingdom, 2018

Noureddine El Karuoi:

- Invited speaker, International Congress of Mathematicians (ICM) in the Probability and Statistics section, Rio de Janeiro, Brazil, 2018

Steve Evans:

- Hotelling Speaker, UNC- Chapel Hill Department of Statistics & Operations Research, 2018

Mike Jordan:

Plenary Speaker, International Congress of Mathematicians (ICM), Rio de Janeiro, Brazil, 2018
Intercampus Research Award, CZ Biohub. 2018

Fernando Perez:

- ACM Software System Award, 2017

Bin Yu:

- Intercampus Research Award, CZ Biohub. 2018

Spotlight

At JSM 2018 in Vancouver Canada, three UC Berkeley Statistics Faculty members were recognized for their work and contributions to the field of statitisitcs.

Peter Bickel:

- SS Wilks Award, American Statistical Association, JSM Vancouver Canada, 2018

Deborah Nolan:

- Waller Award for Distinguished Teaching Career, American Statistical Association, JSM Vancouver Canada, 2018

Bin Yu:

- Elizabeth L. Scott Award, American Statistical Association, JSM Vancouver Canada, 2018



Erich Lehman Award: Yuting Wei

Department Citation Award: William Wang

Alumni Story

Dennis J. Aigner, MA, Applied Statistics, 1962

At UC Berkeley I was able to combine a Ph.D. in Agricultural Economics (with an emphasis on econometrics) with a master's program in the Statistics Department. I remember vividly my coursework with David Blackwell, Jerzy Neyman, Elizabeth Scott and Evelyn Fix. My supervisor was Ed Barankin, and I will never forget the work involved in preparing 50 questions (to which I had to know the answers) from which he would select some to ask me in my oral exam. Afterward, Ed told me that I passed in part because some of my questions were so good. (I guess the answers were OK too.) Department Citation Award in the Master's Program: Mohamed Skander Jemaa & Xinyi Zhang

As a married graduate student with two children, I helped support myself with a job as a Mathematical Statistician at the USDA Forest Service office in Berkeley (now in Albany). My first published journal article appeared in JASA in 1965 based on work I had done there.

My preparation in statistics at UCB served me very well during a research and teaching career in econometrics and statistics that spanned 45 years at four different universities, including a 20-year stint as one of the primary editors of the Journal of Econometrics. I also developed a consulting practice and secondary career as an expert witness, in which I am still active. Sample design and analysis, which I first learned in courses at the Statistics Department, became a lynchpin of that work.





Update from SUSA By:

By: Adish Jain

ver the course of the last academic year, the Statistics Undergraduate Student Association (SUSA) saw a great deal of growth and change — the first of which came in the form of a new name, replacing the earlier Undergraduate Statistics Association. This change of name and logo brought with it a revitalization of the organization's member base, events, and overall presence on the Berkeley campus.

Indeed, over the course of the Spring 2018 semester, SUSA saw incredible growth in its member body, boasting a record-high 100+ members. With this came a surge of events, both internal and external, that SUSA held. Internally, SUSA developed an office hours system to aid underclassmen pursuing statistics and data science classes, developed a series of refined lectures and presentations on statistical concepts, and held more socials than any previous semester. On the flip side, SUSA developed its external presence on campus by participating in a variety of outreach events. The organization, in collaboration with Nexus, hosted its first major tech company for a Data Science at Microsoft info-session. Moreover, SUSA worked to facilitate a tighter connection between undergraduates and Statistics faculty by introducing Faculty Coffee Chats in addition to its semesterly Faculty dinner. Additionally, with the new Nexus organization, SUSA leveraged connections with other data science-related organizations such as Cal Actuarial League and Data Science Society to co-host a variety of workshops and socials.

Throughout the coming semester, SUSA aspires to continue on this trajectory of growth. The executive team and the committee directors have some great new ideas which they hope to see materialize over the course of this next academic year. Perhaps the most ambitious of these ideas is the addition of an entirely new committee into SUSA's structure. Headed by co-directors Patrick Chao and Isabelle-Townley Smith, the Education Committee will work on developing presentable lecture materials for subjects from Version Control, to Python and R, to more advanced Machine Learning topics. In addition to presenting these lecture materials and workshops at SUSA's own Career Exploration committee's meetings, SUSA will be working closely with the Data Science Society to push these resources out to the larger Berkeley community in the form of a joint-DeCal. SUSA hopes to use these lecture materials and its collaborative effort with DSS to form its own DeCal in the semester of Spring 2019.

Overall, SUSA has a jam-packed semester ahead of it, and we can't wait to see these new developments transpire over the course of next year! Go Bears!

Berkelev Statistics

Whith the fulfillment of many old traditions and the introduction of several new ones, the SGSA had a fun and productive year. Starting with our annual welcome picnic, the SGSA continued to host a wide array of events to bring the department together. From highly contested foosball tournaments to lightly contested wind downs, good times were had by all. We also established some new events such as a Lunar New Year party co-organized with the masters students.

To bolster established events like the gender issues roundtable and diversity lunch, student leaders wrote a letter to the faculty addressing issues of community, diversity, and inclusion with the hope of strengthening the department's sense of community and

Update from SGSA

By: Eli Ben-Michel, Bryan Liu, Jamie Murdoch, & Sara Stoudt

ensuring that students are supported as they progress through the program. In response, Professor Deb Nolan set up a Community Task Force made up of students and faculty to solicit feedback from the graduate students, brainstorm ways to improve the graduate student experience, and make recommendations for ways the department can strengthen its sense of community and its support structures.

In an effort to provide a student-led support system, a new peer mentoring system was created. Incoming students were paired with existing graduate students. These mentors helped with the transition to PhD life by answering questions and providing advice. The program was a success and will be continued this coming year.

As we prepare to start a new year, the SGSA warmly welcomes the new cohort of incoming students and the two new co-presidents, Eli Ben-Michael and Bryan Liu. This year, SGSA will be tasked with implementing the recommendations of the Community Task force. One major theme of the recommendations involve facilitating formal and informal interactions between incoming or junior students and senior students. In addition to continuing the mentor program, the student seminar committee is tasked with creating a student seminar series to provide a setting for senior students to

present their research or host workshops. More informally, we hope to organize weekly lunches as an opportunity for students to interact. We aim to maintain the SGSA website as a useful resource for both prospective and current students. We also wish to improve the overall sense of community by expanding the variety of wind downs to include board game nights, karaoke, or outings into SF. Our aim is to build a cohesive cohort across students in all stages of the PhD, where each individual can feel supported by all of their peers.



Ways to Make an Impact: Supporting Berkeley Statistics

The campus has continued to put strict limitations on the budget. This is why we depend on the support and generosity of our donors to help Berkeley Statistics remain one of the two preeminent centers for Probability and Statistics in the world. There are several ways to make an impact. One way is through a donation to a variety of identified needs in Berkeley Statistics, such as graduate student support, graduate student teaching top-offs, funds for the renovation of our classrooms and facilities, support to hold department seminars, and help for the student associations.

• Go online to www.statistics.berkeley.edu/giving. This will take you to a page that provides a list of established funds. The page provides links to descriptions of each fund and a link to donating online through the Give to Cal secure site.

• Use the enclosed envelope to make donations by check or credit card. Checks should be addressed to "UC Foundation." If you have an identified need or special fund that you would like to support please note on the check. If you do not identify a special fund, your donation will go to the Friends of Statistics Fund.

• Companies interested in becoming members of the Industry Alliance Program may contact Erin Blanton, Assistant Director of the IAP, for more information. 375 Evans Hall Berkeley, CA 94720-3860 eblanton@ berkeley.edu 510.643.0589

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Berkelev Statistics

Professor Yu: cont'd from page 5

analyzed under stylized models to obtain a better understanding of how and why they work. Mostly, I try only to invent tools that are solving new, real problems.

Q: At the beginning of your career, your work was much more on the theoretical side. How did you manage the transition from the mathematical to the applied realm? I have been interested in the applied realm ever since I decided to go to graduate school in statistics in 1984 at Peking University. Even then, I knew that I wanted to use my math skills to benefit society, I just didn't know how. During my PhD at Berkeley, I started to gain applied experience and critical thinking skills by taking applied classes and more importantly having regular and extremely stimulating discussions with Terry Speed (one of my PhD advisors) on wide-ranging topics, research and beyond, and working on an applied statistical project with Speed and Dr. Krauss of LBNL. I was also talking to my other advisor Lucien Le Cam regularly and very much inspired by the fact that Lucien went into cancer research later in his career, especially considering how theoretical he was in his early career. But even though the interest and effort were there, in those days I only really published theoretical work.

Eventually, in the collaboratory environment at Bell Labs in the late 90's while on leave from Berkeley, I started to move towards engineering and signal processing problems. I soon discovered machine learning through bagging and boosting, and over the next few years found collaborators in remote sensing, neuroscience, genomics and now precision medicine. These collaborations arose from satisfying my curiosities and embracing opportunities with people that I liked and worked well with, but it have always been my interest and drive to be useful that has propelled me to constantly seek and take new opportunities.

Q: What are your views on the importance of "soft skills" in research. Are there any particular soft skills that you would recommend graduate students and junior faculty focus on?

Probably the most important soft skill is the ability to communicate, resolve conflict, and work with others in a productive and fair manner. This requires the ability to understand oneself and others objectively in order to create a positive synergy, allowing the team to solve complex problems that can't be solved by any one individual by themselves.

Q: What changes do you believe would be most valuable for the field and why?

I believe that it is important to put practice and impact at the center of statistics, while using theory as a support to the practice. We need to value empirical evidence, new and relevant concepts, and new computational platforms as pillars of our enterprise. As statisticians, we need to be adaptive and expansive as new data challenges emerge.

Will Sandholtz: con'td from page 7

Volunteering is good too. Time and money are substitutes for me, as an economist. Even if you can't donate money, donating time to your community is good or whatever cause. I also think voting is important.... There are so many people in this world who don't have the ability, the opportunity and the privilege to have a voice in their own government...."

Will has a problem solving spirit and limitless potential. We are proud to count him as an alumnus of the Statistics Department and are excited to see what his future brings.

Professor Blackwell: cont'd from page 8

While a professor at Howard University, in 1941, Blackwell was approached by the chair of Berkeley's mathematics department and interviewed to join the faculty.

Blackwell didn't get the job, assuming his inexperience and the military draft had made a female competitor for the job a better candidate. Only when he finally joined Berkeley's faculty in the 1950's did he learn that his race had been the reason he didn't get the job, Blackwell said in a 2002 interview.

But times changed, and within 10 years Blackwell was offered a full-time position at Berkeley. He made tenure and eventually served as chair of the newly formed statistics department between 1957 and 1961.

Blackwell also served as assistant dean of the College of Letters and Science, where his job was to review requests from students about their classes, school policy or grades.

"I enjoyed that a lot, helping students," he said in the 2002 interview. "The student was asking to be excused from some regulation or be given some exemption or something of that sort. And I almost always said yes. We would have lively debates in the council of deans, and sometimes I'd win and sometimes I wouldn't."

"I enjoyed that," Blackwell added. "And I think I was helpful to the students."

Source (abridged): Kane, Will (February 8, 2018). New dorm to honor Berkeley's first tenured black professor. UC Berkeley News Center. http:// news.berkeley.edu/2018/02/08/new-dorm-to-honor-berkeleys-firsttenured-black-professor/

Professor Aldous: con'td from page 13

as a project-based course for Statistics Majors, emphasizing the diversity of contexts where probability appears.

Beyond his research and teaching interests, David has contributed to the popularization of probability by numerous online reviews of popular books about probability, which may be found as part of the "Probability and the Real World" website which he maintains beneath his departmental homepage. His further interests include volleyball, science fiction, and Monte Python reruns.