Fraternity of the Few
Dr. Cristen Adams and three Berkeley Optometry alumnae identify opportunities to improve diversity, equity, inclusion, and belonging at Berkeley Optometry.
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Humans didn’t evolve to be good at driving, so there’s an obvious appeal to the idea that computers and robots might be better than us, but “The problem of making autonomous vehicles safe is just orders of magnitude more difficult than anybody realizes,” says Bruno Olshausen, Professor of Vision Science, Optometry, and Neuroscience. P. 12
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On the cover: Dr. Cristen Adams, Class of 2016
The UC Berkeley School of Optometry has created the Tony Adams Lifetime Achievement Award and the inaugural recipient is Tony Adams.

Tony Adams completed his optometric training at the University of Melbourne in 1962. There were five in his graduating class and three of these (Tony Adams, Don Mitchell, and me) have had long academic careers. He then went to Indiana University for his research training before being recruited to join the Berkeley faculty in 1968 at the age of 27. He rapidly became a prominent figure in both the school and the profession.

Within the School of Optometry from 1974-1985 Tony Adams served as the graduate advisor and Assistant Dean for Academic Affairs under Dean Jay Enoch before becoming Dean from 1992-2001. As Dean, his first duties were fundraising and battling with architects, builders, campus officials, and faculty members, as two new floors were being added to Minor Hall to accommodate new biological research labs and an animal facility.

In response to rapid changes in optometry’s scope of practice, Adams organized the school’s TPA training program, arguably the nation’s best, and he established a Refractive Surgery Center within the School of Optometry clinic. To advance patient-based research, Dean Adams secured funds from Lion’s International to build the Clinical Research Center on the lower floor of Minor Addition. And towards the end of his time as Dean a donation of $1.6 million from the Pamela and Kenneth Fong fund enabled major renovations of the library, the main lecture room and other facilities in Minor Hall.

Dean Adams appointed six new faculty members. John Flannery, Suzi Fleiszig and Chris Wildsoet were appointed as assistant professors and, following long negotiations, Tony persuaded the campus to establish the Professor of Clinical Optometry series and the first appointees were Bob DiMartino, Deb Orel Bixler, and Wayne Verdon.

Tony made numerous important contributions to the optometric profession and I will mention he was a director of the National Board of Examiners in Optometry and chaired its Examination Reconstruction Committee for 3 years when it made its most revolutionary changes.

In 1981, he was appointed to the National Academy of Science’s National Research Council Committee of Vision, and he became chair in 1985. For 11 years, I was the AAO and the AOA representative on the Committee on Vision and my time there overlapped with Tony’s. I witnessed Adams’ creativity and leadership in action as he drove the Committee on Vision through its most highly productive period. One of its reports, *Myopia, Progression and Prevalence*, provoked interest from the National Eye Institute. Adams’ persistent lobbying led to the NEI funding its first project on refractive error, the Orinda Longitudinal Study of Myopia, with Adams as PI with his graduate students, Karla Zadnik and Don Mutti.

Adams’ innovation and leadership brought many changes to the American Academy of Optometry. He was a driving force on the AAO Committee on Research (1986-1990) when it initiated a program of travel fellowships to enable selected graduate students to attend AAO meetings. This program has since mushroomed. The committee organized summer research workshops, run jointly by the AAO and the AOA to provide research training to young optometric faculty members from American schools of optometry. The first workshop, held on the Berkeley campus, quickly led to an optometric multi-center study of keratoconus (CLEK) funded by the NEI, and many more were to follow.

Adams was elected to the Executive Board of the American Academy of Optometry in 1990, and he became president from 1998-2000. He led a series of reforms related to admissions, committee service, student involvement and international membership. He also served on the editorial board of Optometry and Vision Science (1980-9) and he was appointed Editor-in-Chief (2004-15).

Anthony Adams has had a spectacularly fruitful career. He leaves a long string of impressive, important and enduring accomplishments in the wake of his leadership of the School and the profession.

He is indeed, a most worthy recipient of this Lifetime Achievement Award.
Ramping Up Telehealth

In response to the COVID-19 crisis, Berkeley Optometry is offering Telehealth appointments conducted via a private video conference between the doctor and the patient.

While our clinic continues to provide in-person eye care for our community, to reach patients that are not able to come to the clinic, we have marshalled the expertise of our staff and the can-do nature of faculty to offer telehealth appointments. This innovative approach to eye care, while not feasible for all conditions, expands our ability to “see” patients without actually being in the room with them. This provides an extra measure of safety and convenience for both our patients and our doctors.

Within two weeks of the first shelter-in-place order, we were able to offer our first Telehealth appointment. We have been able to consult with patients in our low vision, dry eye, and contact lens clinics; provide ocular disease care, sports vision, vision therapy and binocular vision evaluation; and provide urgent care triage. So far, we’ve completed over 800 Telehealth appointments.

The success of the Telehealth initiative shows the “all hands on deck” approach to patient care that is the hallmark of Berkeley Optometry. And although we have been able to continue in-person clinic services by implementing COVID-19 safety protocols, Telehealth appointments will remain available where appropriate for the convenience of our patients.

Kudos for the success of the Telehealth program goes to our Residents, Patient Services Manager Angie Gonzalez, and the entire clinic staff, who worked tirelessly to support the Telehealth committee, led by Dr. Harry Green and supported by Drs. Mika Moy, Kuniyoshi Kanai, Carl Jacobsen and Meredith Whiteside.

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Top 10

Books About Seeing
Not surprisingly, books about vision, eyes, and seeing abound. Vision is one of our most valuable senses, so stories about losing sight, or finding it again, evoke an emotional response in all of us. And sometimes the seeing is not about vision, but the ways in which we “see” the world — despite our vision — that are most important.

1>

All The Light
We Cannot See
Anthony Doerr
Dean Flanagan’s top choice; this is the story of a young French girl who goes blind, and of an orphan German boy pressed into service by the army. Their paths collide in occupied France as both try to survive the devastation of World War II.

All the Light We Cannot See
A NOVEL

ANTHONY DOERR
2 Slaughterhouse-Five Kurt Vonnegut
This is a sci-fi novel about Billy Pilgrim who becomes a time and space traveling optometrist after World War II in the fictitious town of Ilium, New York. Berkeley Optometry alum Darrell Carter OD, PhD, who taught at the school for years and who passed away earlier this year always said that the book "was the story of his life."

3 Blindness José Saramago
A city descends into chaos due to an unexplained epidemic of blindness. Social order quickly evaporates as the newly blind are confined to an empty mental hospital, while criminals go on the rampage. The story follows a small group that bands together and survives only due to their ingenuity. "A magnificent parable of loss and disorientation that shows sight alone does not make us human."

4 From the Corner of his Eye Dean Koontz
This tale of heroes and psychotic villains follows the story of Bartholomew Lampion, whose unusual eyes are said by many to be the most beautiful they have ever seen. Tragically, his eyes are removed by a surgeon to stop the spread of a fast-growing cancer, but he adjusts and emerges as a child prodigy. Later, he miraculously regains his sight. "How he regains it, why he regains it, and what happens as his amazing life unfolds and entwines with others results in a breathtaking journey of courage, heart-stopping suspense, and high adventure."

5 The Diving Bell and the Butterfly Jean-Dominique Bauby
After suffering a devastating stroke, Jean-Dominique Bauby, editor of Elle magazine, woke from a coma to discover that the only remaining part of his body that properly functioned was his left eye. He soon learned that he could express himself in great detail by blinking his eye to select letters (and ultimately form words) from a frequency-ordered alphabet that was recited to him by an assistant. Using this method—and 200,000 blinks—he dictated his memoir, which was published two days before he died.

6 A Mango Shaped Space Wendy Mass
Thirteen-year-old Mia Winchel has synesthesia, a condition that causes a mingling of the senses. From the outside, she seems like a typical teenager, but for Mia, sounds, numbers, and letters have color, which makes her feel like a freak. She tries to keep this a secret, but eventually she is forced to reveal her condition. Over time, she develops an understanding and appreciation of her gift.

7 Lord of the Flies William Golding
This tale of heroes and psychotic villains follows the story of Pecola Breedlove, an eleven year old Black girl who is ridiculed for her brown skin and curly hair. She "prays for her eyes to turn blue so that she will be as beautiful and beloved as all the blond, blue-eyed children in America." Nobel prize winning author Toni Morrison's first book "asks powerful questions about race, class, gender ... and our obsession with beauty and conformity."

8 The Bluest Eye Toni Morrison
The Bluest Eye tells the story of Pecola Breedlove, an eleven year old Black girl who is ridiculed for her brown skin and curly hair. She "prays for her eyes to turn blue so that she will be as beautiful and beloved as all the blond, blue-eyed children in America." Nobel prize winning author Toni Morrison's first book "asks powerful questions about race, class, gender ... and our obsession with beauty and conformity."

9 Crashing Through Robert Kurson
Blinded at age three, Bay Area resident Mike May defied expectations by breaking world records in skiing, joining the CIA, and becoming a successful entrepreneur, and family man. He never yearned for vision, but a chance encounter brought startling news: a revolutionary stem cell transplant surgery could restore his vision. It would allow him to drive, to read, to see his children's faces. The procedure was filled with gambles, some of them deadly. Crashing Through "explores what it means to see—and to truly live."

10 The Country of the Blind H.G. Wells
Nuñez, a mountaineer attempting a summit, slips and falls into an isolated valley where disease causes all newborns to be born without sight. The villagers are successful and fully adapted to life without vision, but have no concept of sight and disregard Nuñez’s description of vision as fanciful imagination. When he falls in love and asks permission to marry, he is turned down by the elders for his “unstable” obsession with sight, which, they say, has caused his brain to be in “a state of constant irritation and distraction.”

ALSO CHECK OUT our featured alumna Dr. Ursual Moonsamy’s choice (p. 24-26)
Haben: The Deafblind Woman Who Conquered Harvard Law, by Haben Girma.
Through Our Eyes

Shazib Haq | CLASS OF 2021

“Fleet Week in the Bay Area (I’m on the far left!) And, of course, we’ve got our 100% UV protection on!”

Amanda Hadeed | CLASS OF 2021

“Bringing Cal pride to SF Pride!”

Germán Aparicio | CLASS OF 2022

“Celebrating after seeing our first patient of 2020 while rocking our matching eyeglasses.”

Taylor Tenn | CLASS OF 2022

“Exploring new heights with my OptoBear fam in Sequoia park!”
Experience the life and times of Berkeley Optometry students through their (smartphone) lens! Please note that these pics were taken before the pandemic. All students are now using masks and practicing social distancing.

Hector Carrillo | CLASS OF 2022

“Taking a break from school and enjoying the California coastline”

Micah Sarmiento | CLASS OF 2022

“Feeling on top of the world while exploring Nicaragua on our 1-week mission trip with VOSH. 4000+ exams total!”

McKenna Turrill | CLASS OF 2023

“First year optos exploring the aquarium during a weekend at California Optometric Association’s Monterey Symposium.”

Shreya Patel | CLASS OF 2023

“An opto-family line’s holiday party”
QuickFacts

Class of 2024

Applicants

188 Applications
51 Students matriculated
114 Interviews

Academics

2.79–3.96 Overall GPA range
3.42 Average GPA in Bio, Chem & Physics
3.5 Average GPA in undergrad
350 Average Score on the OAT

A look at the class of 2024: who they are, where they come from and how they got here.
Student Profile

17
Out-of-State

20-29
Age Range

34
California

48
Number of students who entered directly from undergrad

3
Number of students who took at least a year off

11
Opto-Camp alumni

Undergraduate Institutions

BOSTON UNIVERSITY
CALIFORNIA STATE UNIVERSITY - CHICO
CALIFORNIA STATE UNIVERSITY - DOMINGUEZ HILLS
CALIFORNIA STATE UNIVERSITY - LONG BEACH
CASE WESTERN RESERVE UNIVERSITY
LOYOLA UNIVERSITY CHICAGO
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SAN JOSE STATE UNIVERSITY
SIMON FRASER UNIVERSITY

SONOMA STATE UNIVERSITY
UNIVERSITY OF BRITISH COLUMBIA
UNIVERSITY OF CALGARY
UNIVERSITY OF CALIFORNIA - BERKELEY
UNIVERSITY OF CALIFORNIA - DAVIS
UNIVERSITY OF CALIFORNIA - IRVINE
UNIVERSITY OF CALIFORNIA - LOS ANGELES
UNIVERSITY OF CALIFORNIA - RIVERSIDE
UNIVERSITY OF CALIFORNIA - SAN DIEGO
UNIVERSITY OF CENTRAL FLORIDA

UNIVERSITY OF CONNECTICUT
UNIVERSITY OF FLORIDA
UNIVERSITY OF ILLINOIS - URBANA / CHAMPAIGN
UNIVERSITY OF MICHIGAN - ANN ARBOR
UNIVERSITY OF SAN FRANCISCO
UNIVERSITY OF TEXAS - AUSTIN
UNIVERSITY OF VICTORIA
UNIVERSITY OF WASHINGTON - BOTHELL CAMPUS/SEATTLE CAMPUS/TACOMA CAMPUS
WILFRID LAURIER UNIVERSITY
The Fraternity of the Few

Four Berkeley Optometry alumnae identify opportunities to improve diversity, equity, inclusion, and belonging at Berkeley Optometry.

BY JOY HAREWOOD, OD, FAAO, DIPL ABO
WITH FARAH GULAID, OD, Sheryl Guillory-Reaves, OD, FAAO, AND CRISTEN ADAMS, OD

The message from Farah came on June 8th at 7am:

“...can we have a meeting of the minds to find ideas to increase Black student enrollment at Berkeley Optometry?”

George Floyd had been killed two weeks earlier, a global pandemic was raging and the streets were erupting with grief. Farah saw a post with the hashtag #blacklivesmatter on the Berkeley Optometry Instagram profile. “What are you doing to increase diversity in the program?” she responded. The disembodied voice from the other side said, “What should we be doing?” Farah then reached out to three people who she thought would help provide those answers.

Joy is Caribbean-Canadian, born and raised in Ottawa, Canada. Farah was born in Oklahoma City, and raised in Jacksonville, Florida. Cristen and Sheryl are both California natives from the Bay Area. Although our origin stories are different, we all share one common thread: we are part of a small fraternity of Black people who have graduated from UC Berkeley’s School of Optometry. Being part of an
exclusive club often brings a sense of accomplishment, but membership to this particular group exacted a tremendous toll. Being “one of the only ones” did not make us feel special, it made us feel alone.

There were off-hand remarks about complexion and unwanted hands touching our hair. There was the joke of people always mistaking one of us for the other: “Come to the front of the class Sheryl!” “Actually, my name is Joy”

We ate lunch in the shadows and studied in solitude. Countless subjective decisions never seemed to go our way. You may have never known we were suffering, but each day brought new professional and personal challenges. The only Black faces we saw during our training were the patients in our textbooks or our exam chairs. Each one of us outsourced culture from other student groups on campus as we struggled to fit in.

Imagine if the most difficult and most expensive years of your education were spent fighting for recognition, searching for a community and dodging hands reaching for your coiled, kinky hair. Berkeley Optometry provided us with an outstanding education, but did not provide a safe and inclusive space for learning.

When we reconnected over Zoom after Farah’s message it was at first a space of catharsis, then an organizing platform. We decided that our stories could no longer be hidden as the pain of anti-Black racism filled our streets, the media and America’s collective consciousness. We penned the project “The Black Advancement Initiative” and started weeks of research and planning.

Optometry has one of the lowest percentages of Black and underrepresented minority (URM) students of any of the major health care professions. The Association of Schools and Colleges of Optometry (ASCO) student data report for 2018-2019 revealed that only 2.7% of optometry students identified as Black or African American. That percentage drops to 0.8% at Berkeley Optometry. Given that Black people make up 13% of the US population, these numbers are alarming. As primary eye care providers in the US we should strive to reflect the diverse communities that we serve.

The lived experiences of Black people cannot be fully taught or trained, but it can be communicated by having Black faces share these stories first-hand. There is data to suggest that having a diverse student body helps all students to work more effectively with people of different backgrounds (Whitla, Silen, Teperow, Howard, & Reede, 2003). By all accounts, having different voices in the room changes the way topics are discussed, generates different questions, and results in more inclusive solutions.

Not only can diversifying the classroom improve quality of care, it can also improve access to care. Research suggests that URM students are more likely to practice in underserved communities (Professions, 2006), and as one of the premier optometric institutions in the country, Berkeley Optometry should enroll students who are equipped to work in these high-need settings.

It is said that “You cannot be what you cannot see.” Having Black and Brown doctors in underserved communities has effects unrelated to eye health; it allows a diverse group of people to see optometry as a worthwhile and attainable profession for people of all races. These are only a few of the reasons why Berkeley Optometry should prioritize increasing the percentage of Black students in its student body and in the optometric profession at large. There is no excellence without diversity, and there is no better place for such excellence than Berkeley Optometry.

With this idea in mind, the four of us sifted through data, reached out to optometry schools across the country and consulted with a diversity consultant to form an action plan. When we approached the senior faculty at Berkeley Optometry it was with one goal in mind: making the school a safer, more inclusive space for Black and Brown students, staff, and faculty.

We recommend that the school take a long hard look at its climate, criteria and culture to determine how to increase Black representation. The data from this assessment should form the foundation of a comprehensive diversity, equity, inclusion, and belonging action plan. To shepherd this process, we recommend the creation of an office of diversity that is tasked with making sure the goals of the action plan are met. This body would coordinate mentorship and recruitment initiatives, as well as provide a safe space for discourse. We want to work to create a sense of belonging and foster inclusion within all levels of the school. There is no point in bringing diversity to the table if we are not going to create a comfortable space for them to eat. Finally, we suggest regular review of the progress in this matter by an independent body to keep us accountable.

It is heartening to see that the current administration is open to change and willing to work on creating a better environment for Black students. The senior administrators at Berkeley Optometry recognize that there is room for significant improvement. Substantive plans have been put in place to realize some of these goals. Although we cannot take all of the credit, we hope we helped provide the motivation for the meaningful change to come.

People have billed 2020 as the year of the eye doctor but “20/20” represents the clarity we seek in our eye exams. Although this year has had its challenges, we see it as an opportunity for monumental change.

As Cristen, one of the brilliant minds on this project, gets ready to bring her first child into the world, we can only cling to the hope that doing this diversity work will make life a little bit better when she or he arrives. If her little one decides to follow in her footsteps, we hope that the path will be easier, more inclusive, and far more reflective of the population that we are privileged to serve.

“There is no excellence without diversity, and there is no better place for such excellence than Berkeley Optometry.”
Are We Ready For Self-Driving Cars?

The challenge of replicating the awesome power of the human visual system

BY ZAC UNGER

When you see a cat, how do you know it’s a cat? It’s got four legs and fur, but with just those criteria it could also be a giraffe or an aardvark. Knowing the typical size of a cat helps, but that additional information could still leave you thinking that this four-legged furry beast is a lemur or a howler monkey. Prior knowledge of how cats move is helpful, but you could conceivably be looking at a baby cheetah drinking milk from a bowl in your living room. In reality, there’s no one thing that lets you know a cat is a cat; in fact, there aren’t even a hundred definitive characteristics that completely seal the deal on how humans tell each part of the world apart from each other part.
Dr. Bruno Olshausen examines the computational processes by which the brain builds visual models of the external world in a video by the Simons Institute for the Theory of Computing.

Instead, your visual functioning, your innate knowledge, and your lived experience all work together, instantly weighing and combining uncountable (and unknowable) factors to bring reality into focus and help you move safely through the world. It’s one thing to tell the difference between a cat and a cantaloupe, but think of how the variables—and the risks associated with getting even one wrong—multiply when it comes to the thousands of images bombarding the eyes of a driver behind the wheel of a moving car. And now imagine that the eye isn’t an eye, but a camera mounted on a shiny new car sold by Tesla, whose CEO, Elon Musk, has promised that full, driverless autonomy will be “complete this year.” The most ancient fossil of an animal eye is over 500 million years old; the first Model T Ford rolled off the assembly line about 100 years ago. Although we take it for granted, driving is the most dangerous thing we do on a daily basis. Is it reasonable to think that cameras and computers can competently replace us? Is it possible that somehow they might even be better than us?

“The problem of making autonomous vehicles safe is just orders of magnitude more difficult than anybody realizes,” says Bruno Olshausen, Professor of Vision Science, Optometry, and Neuroscience at UC Berkeley. “There are certainly some things you can do, like alert the driver when they’re beginning to fall asleep or weave out of their lane. And I think that’s great and we should definitely do all of those. But the idea that you’re going to solve all of the problems? It’s like playing whack-a-mole; as soon as you solve one problem another pops up.”

The main difficulty isn’t the mechanical act of driving; training robots to react predictably to defined stimuli is already robust. Instead, the problem is more basic: how does a self-driving car “see” and how does it process the images it takes in? Most of these vehicles use multiple mounted cameras which feed images to a computer. Those images are processed and used to determine variables like where the road is, what traffic conditions are, or if there are pedestrians nearby. Autonomous cars also often employ LIDAR, a laser that measures the distance between objects. “But the really hard part,” says Olshausen “is the part of intelligence or perception that we call common sense reasoning.” If you’re driving fast on an elevated freeway in heavy traffic and you see a ball bounce out of the back of a pickup truck, your best bet is probably to drive right over it. But that same ball, taking that same bounce, but this time originating from a playground in a residential neighborhood is likely to be followed by a child running into the street. “It’s a very difficult problem to solve,” says Olshausen. “Because if you have an autonomous agent moving about in a three-dimensional world, you’re going to encounter all kinds of unpredictable things.”

Proponents of autonomous cars would doubtless suggest more data, more artificial intelligence “deep learning,” better algorithms to deal with more and more situations. But Stella Yu, who is a member of the Berkeley Optometry’s Vision Science Group and is also the Director of the Vision Group at the International Computer Science Institute, suggests that big data has big limitations. “The long tail is actually the norm,” she says, referring to the staggering array of different visual stimuli that drivers encounter every day. Yu mentions ImageNet, a commonly used data set with millions of photos, each painstakingly labeled and annotated by hand. Once a system is trained to use these images it will do a great job of responding appropriately to what it already knows. “But if you take a camera and walk around the Berkeley campus,” she says, “the images you record won’t match the images that the data set curated.”

Every stock image has innumerable variations like tricks of light and shadow, people lost in crowds, pedestrians partially obscured by trees. And what is a pedestrian anyhow? It could be anything from a dad with a stroller waiting patiently in a crosswalk to a woman in a billowing, sequined dress leaping for a frisbee, to an old man with two canes tripping over the curb and stumbling into the road. ImageNet and YouTube will train your computer to identify a cat, but can we count on the datasets to correctly capture all of human experience? “There are all sorts of low-probability events that the world is going to throw at you every day,” says Olshausen. “And if your performance is at a 99 percent level, then that means that one out of a hundred times, the system is going to make these really stupid errors.” Multiplied across billions of cars and hundreds of billions of miles driven, minuscule probabilities compound into significant risks. Yu echoes Olshausen’s concerns: “If your system only performs on things it has already seen, then it just memorizes the answers. But the purpose of learning is so that you can generalize to new instances. The setup itself is set up for failure.”

Humans didn’t evolve to be good at driving, of course, so there’s an obvious appeal to the idea that computers and robots might be better than us at this new-fangled activity. “We don’t have sensors that directly measure distance. We only have two eyes.” Yu says. “But what really is an image
to a computer vision system? It’s just an array of numbers. When we look at something, we immediately process it through a complicated system, from the retina to V1, V2 (the primary centers in the cerebral cortex responsible for processing visual stimuli). But a computer just has a camera that acquires a certain intensity of light, pixel by pixel, and then it has to make sense of the data.” Even just deciding how many pixels and what height-to-width aspect ratio to use—a pedestrian is an entirely different shape than a speed bump—is a problem that humans solve instantly but computers struggle with.

A computer vision system will take, say, a fifty-by-fifty pixel patch, determine where the image inside that box lies on the red-green-blue spectrum, do a 3D numerical analysis of the light intensity, and then ask itself whether what it’s currently processing resembles something it has already seen in training. Some of the patches in the stored data set will match with what the computer knows as “person” and some will match with “crosswalk” or “low-hanging tree branch.” But, Dr. Yu says, “the thing is that you don’t know that this pixel patch is where the important object is, so how does the computer even propose a particular object area to start the classification work?” Yu calls this a “windowed classification” system, which is quite different from the way human vision works. “We don’t do piecemeal analysis,” she says. Unlike a computer, the human visual system doesn’t analyze each part of the visual field discretely and separately from each other part. Instead, our ability to recognize a part depends on our ability to recognize the whole. The computerized system works well if it is looking for a pre-defined target of interest, but breaks down with the introduction of confounding variables.

“Neural networks can play computer chess to beat a human,” says Olshausen, “but if you actually gave the computer a chess board and it had to move pieces, it would make catastrophic mistakes just because you’d have the sun shining on the pieces from a weird angle, and the robot would do something like misestimate its position and jam the pieces on the wrong side of the board.” Olshausen mentions the difficulty of incorporating something as simple as rain into the worldview of a computer vision system. “Imagine if some drops get on the camera lens,” he says. “So now it’s going to create a corrupted image and have trouble perceiving the world through all that interference. Intuitively understanding the physics of water is something that we don’t ever think about, and yet our perception has evolved to deal with it effortlessly. And then you start thinking about how the world looks once the wind starts blowing…”

While Olshausen believes that truly safe and effective autonomous cars are still a long way off, he does have suggestions for how engineers and programmers can make improvements. “The people who are working on these systems have a lot to gain by studying human perception and biological vision,” he says. While trying to mimic biology can be carried to extremes—early airplane designs called for wings that flapped—nature has developed strategies that could prove crucial.

One innovation that Olshausen sees as important involves making the mounted cameras less static. “Photoreceptors in the eye are not uniformly sampled by the retinal ganglion cells,” he says. “They’re very densely sampled in the fovea, the central one degree of vision, and then they become more coarsely sampled as you go out towards the periphery.” Standard cameras, by contrast, have their photoreceptors uniformly distributed on a rectangular grid. Processing visual information is resource-intensive for humans or machines, a problem animal eyes have solved by packing the high-resolution capabilities into the center and then moving the eye itself towards the object of interest. “This strategy is much more important than people acknowledge,” Olshausen says. He suggests that engineers adopt a strategy in which the mounted cameras “move in different directions very rapidly like our eyes, and then have a sampling strategy where they focus the high resolution on the sensor and then fall off at the periphery. Together with the eye movements, this would give you a virtual high-res sensor with wide field of view.”

Both Olshausen and Yu think that truly autonomous vehicles are many years further away than the titans of industry would have consumers believe. When asked if she’d be comfortable riding in one today, Yu answered, “It depends on what kind of road I’m on and what the consequences of a mistake are. There are some situations like warehouse driving or a safari in a park that could work. If the highest speed is five miles an hour and there’s a fixed route with no crowds around and the lighting is good, then maybe yes.” Which, given that those constraints describe almost zero real-world driving situations, sounds more like a “no.”

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Finding a Way Through New AR Technology

Exploring next generation augmented reality headsets to boost orientation and mobility

By Gordy Slack

Each week the clinic opens its doors to patients whose vision impairments cannot be corrected by glasses, surgery, medication, or contact lenses. Berkeley Optometry’s Low Vision Clinic introduces them to a chest of tools and community resources addressing each patient’s specific needs. Low vision affects nearly one in thirty Americans over the age of 40 (many with age-related macular degeneration, glaucoma, and diabetic retinopathy), but also affects children with congenital conditions or who have suffered trauma resulting in vision loss.
“Our patients range from 4 years old to 104,” says Marlena A. Chu, OD, FAAO, Chief of the Low Vision Clinic, which has locations at UC Berkeley, California School for the Blind, and San Francisco LightHouse for the Blind and Visually Impaired. “It’s unusual and great to work with pediatric patients, high schoolers preparing to enter college, people just starting or changing careers, and older patients new to low vision.”

Directing patients with low vision toward potent tools that can help them operate freely in a sight-oriented world is a hopeful and exciting practice, says Chu. “People often expect it would be a depressing clinic. Really, it’s often a joyful place,” she says. “There are so many things low vision devices and rehabilitative resources can do to make things better and easier for people.”

The clinic’s recommendations include stalwart tools such as the mobility cane, the guide dog, and tried-and-true optical magnification devices. In recent years, some smartphone-based reading apps and navigational tools have gained traction, especially among younger patients. There are even some remarkable wearable digital magnification tools that help those with low vision to better read the world around them.

But a strong buzz is growing around a frontier that could soon create a new class of integrated tools with a simple hands-free user interface and a form factor that resembles a pair of heavy glasses. As its name suggests, Augmented Reality (AR) enhances regular perception with layers of information either adjacent to or overlying an unimpeded view of the real world. The best-known examples are probably from the worlds of engineering design and gaming, where computer-driven headsets allow users to project useful or fantastic images onto their experience of the actual world before them.

Unlike AR’s more famous sibling, Virtual Reality (VR)—which presents a fully manufactured view of the world through a closed headset—an AR display is reflected to the eyes indirectly, so the added images do not occlude the user’s view of the actual world. They just add layers of information to the natural view.

When new patients first come to a low vision clinic, their most urgent request is typically to be able to read better, Chu says. And she can often help with optical magnification devices. In close second place, however, is a desire to improve mobility and orientation, says Chu. To make new inroads on that front, she has recently begun collaborating with Emily Cooper, PhD, a new UC Berkeley Optometry faculty member who studies ways to improve AR displays, specifically with an eye toward helping low vision patients.

Cooper, who recently moved to Berkeley from Dartmouth in New Hampshire, where she also conducted research on AR displays, says she believes that a new generation of lighter, more powerful, lower-profile AR headsets “may be able to assist many people with limited vision to navigate and could have a significant impact on the quality of life of millions of people.”

Cooper is currently putting the new functionality of next generation AR devices to the test. She is working with a popular commercially available headset made by Microsoft. The HoloLens, as the headset is called, was initially released in 2016, and its successor—the
Jonathan Huang, Cooper developed a prototype AR-based software application to assist by searching out real-world signs, room numbers, and other text on command, highlighting the whereabouts of the text on the display and reproducing it in high-contrast magnified text.

The AR headsets also have built-in microphones and speakers. They respond to voice command controls, so that they can read sign text aloud to users on the move. Eventually an application such as Cooper’s might also be able to answer navigational questions, such as “Where is the closest elevator?” or otherwise respond to voice commands. That the device is hands-free could be particularly useful if it is used in conjunction with a mobility cane or guide dog.

Preliminary tests of Cooper’s app, published in 2018 when she was still at Dartmouth, show promise for the approach. Fully sighted subjects with simulated visual impairment approximating those of a low vision patient were given the task of finding an office or a restroom inside a building. The subjects with the AR software took more direct routes to their destinations, but they also tended to walk more slowly. This work suggests that a better understanding of how to design AR applications that integrate naturally with users’ navigational strategies will be important moving forward. In addition to continuing this work, Cooper and her collaborators on that project have made their code available to others who are developing similar applications for low vision users along those same lines.

“Emily appreciates the clinical perspective and she’s looking closely at both the needs of the patient and the practitioner. Her work is very much informed by optometry, and that’s unusual.”

Chu is enthusiastic about the new technologies and the applications she and Cooper are developing to best exploit them. She’s seen high-tech tools come and go, she says, but “Emily’s approach is a little different than your typical Silicon Valley company,” she says. “Emily appreciates the clinical perspective and she’s looking closely at both the needs of the patient and the practitioner. Her work is very much informed by optometry, and that’s unusual.”

“It’s early days for this technology,” says Cooper, adding that she hopes to exert a strong evidence-based, patient-need-driven influence on the technology as it continues to mature.

Chu urges her patients not to hang up their canes just yet and to keep their orientation and mobility skills sharp. After her many years in the clinic, she is still impressed by how much difference good orientation and mobility skills make to a patient’s wellbeing. It might be better to think of these devices as “strong bridges to orientation and mobility skills,” not a replacement for them, Chu says. “Every patient I’ve ever had or talked to who master their orientation and mobility skills, they all say it opens up their world! It helps them get their independence and confidence back. It just makes a world of difference.”
For five decades, our window into learning about how psychedelics affect the brain and mind, including visual perception, was shuttered to all but a handful of researchers in the United States. Today, the new UC Berkeley Center for the Science of Psychedelics, headed by Dr. Michael Silver, a professor in the School of Optometry and the Helen Wills Neuroscience Institute, is preparing to fling that window wide open.

Seed-funded with $1.25 million from an anonymous donor, the center will be a hub for basic research, public education, and training for psychedelic experience guides.

While the use of psychedelics in plant- or fungus-based form by indigenous spiritual practitioners goes back millennia, these compounds only became subjects of scientific research in the 20th century. In the 1960s, these natural substances and their synthesized cousins, like LSD and MDMA, “escaped the lab,” and their recreational use became popular around the world. Then public backlash and governmental criminalization made continuing research with psychedelics in human subjects nearly impossible.

But a trickle of psychedelics research continued in recent years, enabled in part by donor-funded foundations and nonprofits like the Santa Cruz-based Multidisciplinary Association for Psychedelic Studies (MAPS). Silver says recent preliminary study results, including some facilitated by MAPS, show that psychedelics, in combination with intensive psychotherapy, can provide mental health benefits. Specifically, they can aid treatment of depression, anxiety, and substance addiction, and help better manage the symptoms of PTSD, including in some veterans.

“Why these drugs are effective as medicines is a largely unanswered question,” says Silver. “What are they actually changing in the brains of people with PTSD and depression to heal them? Also, the idea that you can take as little as 100 micrograms of a substance such as LSD and it radically changes your perception of the world—that’s pretty fascinating for anyone who wants to understand the mind and the brain and how we generate conscious experience.”

These positive clinical results and unanswered questions about the psychological and biological effects of these drugs are awakening the scientific community to the value of studying psychedelic compounds. Another timely indicator: Silver points to the popularity of Michael Pollan’s book, “How to Change Your Mind.”

Named one of the 10 Best Books of 2018 by The New York Times Book Review, Pollan’s bestseller draws attention to what he calls “the new science of psychedelics.” That pedestal positions him, as another of the Berkeley center’s founders, to guide its public education efforts, including plans for a website, podcast, newsletter, online courses, and conferences.

Another center founder, Sam Shonkoff, assistant professor of Jewish Studies at the nearby Graduate Theological Union, will help develop the guide training program. Guides will learn how to safely lead healthy volunteers through personal growth sessions combining psilocybin—a naturally occurring psychedelic compound found in some species of fungi—experiences with talk therapy.
“The training of guides is an indispensable part of this center,” says Shonkoff.

Other founding collaborators include David Presti, professor of neurobiology, and Dacher Keltner, professor of psychology and director of the Greater Good Science Center. Silver will focus his efforts on basic research. As a vision scientist, he studies how our brains construct visual perception from the relatively limited sensory information provided by our eyes. After patterns of light entering our eyes are transformed into neural activity and then transmitted to the brain, “massive amounts of neural machinery and computation” are required to construct what we visually perceive. Eyes cannot do it alone.

Understanding that brain machinery is a major focus of Silver’s laboratory, and the new center will enable him to use psychedelics to illuminate its processes. “We want to use low doses of psychedelic drugs, such as psilocybin, the active ingredient of ‘magic mushrooms,’ to pull the curtain aside so we can begin to understand these basic mechanisms,” Silver says.

In small doses, psilocybin appears to loosen the brain’s strong reliance on using past experiences, known as “prior information,” to construct perceived reality. In daytime, for example, outdoor light tends to come from above, and depending on the time of day, its angle shifts. These kinds of “ priors” guide the brain to swiftly infer a visual scene’s content, even when provided insufficient or ambiguous visual information.

In one experiment Silver is planning, participants will view a short movie clip of four angled line segments. These line segments may be perceived either as four disconnected elements or as single higher-level shape formed by grouping of the four elements. A brain scanner will be used to record participants’ functional MRI (fMRI) responses to what they view.

Prior experience combining contours into shapes may influence perception of this ambiguous image, so brain activity when subjects perceive the stimulus as line segments will be compared with brain activity when they perceive it as a grouped shape. Each participant will view the movie twice, once after ingesting psilocybin and once after placebo.

Comparing these activation patterns, with and without the drug, will illuminate how brains construct visual experience. “The drug alters visual processing on the fly, and we want to understand how that happens to better understand the principles and mechanisms of visual perception as it occurs in everyday life,” Silver says.

Brain mapping maven Jack Gallant, a professor of psychology affiliated with Berkeley’s vision science group and a member of the psychedelics science center, is also fascinated by how brains construct visual experience. He says about 25 percent of all brain function is devoted to vision. It’s early days yet, but he imagines bringing his expertise—creating detailed brain models by analyzing fMRI data—to bear on learning how psychedelic substances affect visual processing.

“We should be able to build better models, build better brain decoding and get more sensitive metrics of what effects these drugs have,” says Gallant. “They may have clinical applications.” For him it’s a question of figuring out more accurately what psychedelics do in the brain, and leveraging that knowledge to potentially enable more effective therapies for mental health disorders or symptom management.

For Silver, the possibility of clinical applications for psychedelics is also powerful motivation. What he learns may add to what’s known about how psychedelics can aid mental health patients. Perhaps psilocybin-induced loosening of dysfunctional habits and thought patterns may help patients recalibrate their emotional responses to traumatic experiences.

“Maybe some measurement of changes in visual processing caused by a psychedelic drug will actually be predictive of which patients, if they suffered from a mental health disorder, could potentially be helped clinically by psychedelics used in combination with talk therapy,” says Silver.

That psilocybin can cause people to experience visual distortions and hallucinations when viewing scenes of everyday life is well known; what’s not well known is that some artificial neural networks trained to recognize objects can do something similar, but without psilocybin.

Silver says that artificial neural networks undergoing training develop some image representations that look astonishingly similar to what some people report seeing under the influence of psychedelics. He suspects that probed how people respond to these “hallucinofied” video clips will further reveal the mechanisms of human visual processing.

Silver plans to investigate this phenomenon in another experiment. While in an fMRI scanner, participants will view videos of natural scenes, once after taking psilocybin and once after placebo. In a third condition, also without the drug, participants will view videos “hallucinofied” by an artificial neural network. Comparing the brain activity patterns across the three conditions will reveal more about how the brain represents visual information and how it can be induced to alter these representations to produce hallucinations.

Though a researcher, Silver sees possible clinical applications for the ability of psychedelic drugs to enhance neural plasticity in the brain’s visual system. For example, adults with amblyopia, sometimes known as “lazy eye,” have impaired vision, caused by abnormal childhood visual experiences that miswired certain neural pathways.

It’s long been thought there is a “critical period” in early life during which normal visual experience leads the brain’s visual pathways to develop correctly. Once the critical period ends in adulthood, brain circuits are thought to become more fixed, limiting the effectiveness of clinical interventions.

But more recent amblyopia research, including work by Berkeley Optometry professors Dennis Levi and Susana Chung, shows behavioral training can help adults with amblyopia relearn normal visual processing. Silver speculates that psychedelic therapy for adults with amblyopia might re-introduce youthful “critical period” plasticity to the visual parts of their brains. That, combined with perceptual training, could help them regain unhampered vision.

It would be a fitting benefit of Silver’s research. A substance used for centuries by indigenous vision-questing spiritual practitioners, and by researchers and clinicians to aid those suffering from PTSD, depression and anxiety, might one day be prescribed to help people with visual impairments relearn their windows of visual perception.
**Betsy Chiem, OD 2016**

*Where are you living now?* New York City, NY

*What are you doing now for work?* I’m currently the Lead Optometrist at MOSCOT, a 105-year old family-owned optical company in New York City. In addition to patient care, I also manage the Eyecare department, overseeing the doctors and technicians working across four offices. One of the things I enjoy about working in NYC is seeing a diverse pool of patients, from lifelong locals to tourists, from aspiring artists to investment bankers, and from Broadway actors to software engineers. I strive to tailor care to each individual’s specific visual and ocular needs.

*What is the web address for where you work?* www.moscot.com

*What bit of advice or wisdom would you have for students just beginning their degree program?* It’s easy to fall into the bubble of optometry school when you are focusing on your studies, but don’t forget there’s a whole other world out there too. Make time for friends, outside hobbies, staying active, or exploring the Bay Area. Balance is key.

**Denise Tirado, OD 2018**

*Where are you living now?* Albany, CA

*What are you doing now for work?* I am currently working part-time at a private practice, OPT Optometric, for a fellow UCBSO alumni, Dr. Philip Tawil, who I must say has been an amazing mentor! The other half of the week I work at an ophthalmology practice: Redwood Eye Center. It has been great being able to work in both types of modalities and see a wide variety of cases. During my spare time, I have been using my fashion design degree from UC Davis to sew facemasks for family, friends, and also selling them on my page @sewingoptometrist on Instagram.

*What is the web address for where you work?* optoptometric.com and redwoodeyecenter.com

*What bit of advice or wisdom would you have for students just beginning their degree program?* Do not forget you are paying for your education—do not be afraid to ask questions! If you feel confused or just need a bit more of an explanation, your professors and all the doctors at Berkeley Optometry are there to help you learn. Also, your classmates are all going through the same process, all have the same goal at the end of the day, so help one another! Leave Berkeley Optometry being the best doctor you can be!
Christy Sheehy, PhD 2015

Where are you living now? Oakland, CA
What are you doing now for work? I’m CEO of C. Light Technologies, a neurotech and AI company that created a 10-second retinal eye-tracking test to assess brain health and drug efficacy, starting with multiple sclerosis. I spun the company out from my graduate work here at Berkeley Optometry and we are now officially raising our seed round of funding! It’s wonderful working on a solution that could have a huge impact for patients with neurodegeneration—an area that I’m super passionate about.

What is the web address for where you work? www.clighttechnologies.com

What bit of advice or wisdom would you have for students just beginning their degree program? Don’t be afraid to ask classmates, colleagues, and professors for help when you need it. Oftentimes in grad school, we can spend months on a problem that if we talked to a labmate or our PI about, it could be fixed in a week or less. Research is best done collaboratively, so be sure to foster that sentiment early on and ask questions when needed!

Milan Lockhart, OD 2018

with Valerie Tran, 2018

Where are you living now: Charlotte, North Carolina
What is the web address for where you work? www.spectrumeyecarenc.com
What are you doing for work: I work in private practice optometry in Downtown Charlotte. Ironically I practice in the same building where part three of the National Boards takes place. We are opening up another practice location in December which is keeping us quite busy even as patient volumes are slightly down due to the pandemic. Additionally, I work as a third party committee member for the North Carolina Optometric Society, and as a retinal consultant for the EyePacs program.

What bit of advice or wisdom would you have for students just beginning their degree program: You’re about to start at the greatest optometry school on the planet—so take advantage of every opportunity that you have to learn from the great minds around you. Figure out what areas of the profession you’re interested in (research, private practice, academia, industry, hospital optometry, etc) and find ways to make inroads with individuals who are where you want to be. You have access to so many great people associated with the school, you’ll be kicking yourself if you’re in your last semester of the program and haven’t utilized the myriad resources Berkeley has to offer. Ask lots of good questions and don’t be afraid to ask for help. Yes everyone is busy, but the mark of a good professor (and we are blessed at Berkeley with many) is that they will make time for your education if you come to them truly seeking to advance your knowledge in the field.
Q & A WITH UR SULA MOONSA MY, OD ’ 97

Eyewitness to Change

Ursula talks about growing up in South Africa, the hardships of living under Apartheid, the joy of casting a vote for Nelson Mandela, the instinct to make a difference, and favorite books.

Dr. Moonsamy is the owner of two Optometry practices, Eye Care Optometry and Eye Care For You, both located in Oakland, CA.

Q Your family wrote a book, The 17th Suitcase: Vignettes from a South African Family. It is a compelling and heartwarming story of growing up during Apartheid. What inspired your family to publish this book?

A My dad, who came from a very humble background, became known as the kid who often helped his parents, other elders in the neighborhood, and friends, write letters or proofread legal and other documents. He loved reading and would sometimes climb onto the roof of their home so he could read undisturbed, which was difficult to do in their cramped little home with nine kids. Later, whenever either of our parents spoke to groups, or my dad posted a story on social media, they were inevitably asked, “Have you written a book?” My dad had actually started writing short stories in his early twenties, on a second-hand typewriter. When we paged through his neat file folder a few years ago, where he kept all of the precious stories, we all agreed that these profound stories needed to be shared. Our hope was that it would inspire others to overcome indignities, especially those caused by racism.

Q In the book, your mother Sue tells of her pride at owning a butcher shop—a vital part of the family's income—in South Africa, but because non-white people were not allowed to own businesses in the city, the shop was licensed to a white man, who suddenly sold it without any remuneration to your family. In an instant, the shop, and all the work that went into it was lost. But years later, your mother's experience of ownership proved valuable to your optometry practice. Can you tell us why?

A The butcher shop, my mom’s first and only business endeavor proved to be a great success not only...
because of her diligence and determination, but her heart for people. Though disappointed that all for which she had worked so hard, was so quickly lost, my mom always impressed me with her tenacity and ability to get right back up. Years later, on a different continent, and with that episode far behind us, I was browsing the Berkeley Optometry School classifieds, and saw a practice for sale in Oakland. I called the Optometrist and went to see his practice that same evening. While talking to him, I got cold feet and apologized for taking his time because I felt like I first needed to learn more about owning an Optometry practice, before purchasing one. He immediately reassured me by saying, “you think I knew about business when I started cold?” I then consulted with the two people that I trusted most. My dad, the voice of reason, advised that I continue to work and pay my student loans down further before incurring more debt. In my mom’s eyes though, I saw the glimmer of excitement. She told me that sometimes it was necessary to take risks and immediately offered her assistance. When I applied for a loan, I was surprised at the high business loan interest rate. My parents advised me to take a loan on their home instead, so I could get a lower rate. Their amazing support, generosity, and the valuable experience that my mom gained in her butcher shop, coupled with her kindness, warmth, and genuine love for people, provided the perfect recipe for success for our small family business, as she became the proud manager of my practice.

**Q In one of the chapters you wrote with your sister Noeline, you tell the story of your mom’s Aunty Mina, who despite being blind, was keenly aware and very descriptive of the world around her. How did hearing these stories about Aunty Mina help to inspire you to become an optometrist?**

**A** While an undergraduate at UC Berkeley, I joined the pre-optometry club to explore this field that I knew so little about. Soon after, I was offered an opportunity to shadow an optometrist. I was shy, and felt so ill-equipped, because I myself had not yet even had an eye exam in my life! After watching and interacting with this kind doctor for a few weeks, I undoubtedly knew that this was the field for me. As an optometrist, on a medical mission trip to Cameroon in Central Africa, a young lady who came to the clinic stood out to me. After seeing her I felt so disappointed, because she was blind, and I knew that no eyeglasses would help her. That same evening, I was asked to speak at a church gathering. I spoke about how I help people see clearly and maintain healthy vision every day because I know how important our physical vision is, yet it is our faith and spiritual vision that is even more important. I then spoke about how a physically blind lady, Aunty Mina, who appeared to navigate life without seeing her blindness as a disability, made such an impact on my mom’s life. I didn’t know at the time that in that crowded hall, the same young lady that I met earlier was present. She came to me at the end with a tear in her eye, and as she hugged me warmly, told me how much she had appreciated my words. She hoped that despite her disability, she too would make an impact. I assured her that with her beautiful, bright personality, she already had made an impact on me.

**Q Who were your other early influencers? Who inspired you?**

**A** There are so many people I admire but I kept coming back to these two while trying to answer this question. They showed me how to love unconditionally and give sacrificially. I recall selfishly asking my mom as a child why she had packed half of our groceries to give to someone who stopped by, and she calmly replied “they need it more than we do.” My parents always had lots of kids in their home and would always feed them before they left. An older cousin recently told us about how on one occasion my parents had nothing at home, and knew the kids visiting were hungry. My mom took her prized possession, a gold ring that her mother had given to her, and asked if he would sell it and buy food. When my cousin returned later that day, they all ate a substantial meal together. My parents complement each other so well because they both have so much compassion for people. I, on the other hand, have some work to do. When my son was about 4 and I told him it was time to donate the toys he no longer needed, he quickly responded, “Mommy I’m keeping all my toys, you could buy some to donate if you’d like to do so.”

**Q** Your sister Priscilla describes a frightening scene of uniformed police with machine guns coming into your school in response to students protesting the Apartheid system. Did seeing South Africa eventually dismantle Apartheid give you hope that the will of the people can be marshalled to overcome injustices and systemic racism in our own country?

**A** I was in the eighth grade, when students in high schools (7th to 12th graders in South Africa), across the country stood up in solidarity and protested at school for 11 weeks. The boycotts were well organized by activists and community leaders who educated us about the inequities of Apartheid and helped us draft demands to present to the government. We also sang freedom songs as we all marched together around the school grounds. Toward the end of the 11 weeks, we watched in shock, as riot police terrorized our school and escorted many of our fellow students and teachers into their intimidating police trucks. Fourteen years later on April 27th, 1994, my first year of Optometry school, I watched history unfold as South Africans all across the globe voted for the first time, in the first free election. I was so happy when my classmates encouraged me to take the day off to accompany my family to the polling station in Oakland to cast our historic vote. The feeling was surreal and tears streamed down my face when I returned to class the next day to tell of my experience. The protests that we participated in as children, and the scores of people in South Africa and around the world who took a strong stand against that dehumanizing system, spurred the action of larger entities to also stand up for justice, and Apartheid was eventually brought to its knees. The Rev. Dr. Martin Luther King Jr. wrote: “I have almost reached the conclusion that the Negro’s great stumbling block in the stride toward freedom is not the White Citizen’s Councils, nor the Ku Klux Klan, but the white moderate who is more devoted to ‘order’ than to justice; who prefers a negative peace which is the absence of tension to a positive peace, which is the presence of justice.” I wish Dr. King were here today to see the many who are standing up to condemn injustice against their fellow citizens, like our own UC Berkeley School of Optometry, that recently took a courageous stand to correct a past injustice. To overcome the systemic racism here, is an ideal that we all have to strive for, by devoting ourselves to a positive peace which is the presence of justice.

**“I watched history unfold as South Africans all across the globe voted for the first time, in the first free election.”**
Q Your family had the honor of greeting Nelson Mandela at the Oakland International Airport shortly after he was released from prison. Can you describe your feelings on that day?

A On February 11th, 1990 we awoke before the crack of dawn to witness, with a group of South Africans, our icon Nelson Mandela take his first steps to freedom after 27 long years. When we left South Africa, we were not even allowed to say his name or have any literature that mentioned him. Seeing him emerge from those prison gates was emotional, to say the least. Local Bay Area news channels were present to tape our reaction. Imagine the excitement, however, when we learned that just four months later, he would be addressing our San Francisco Bay Area. Tickets to the Oakland Coliseum sold out in record time. My youngest sister Noelle, was asked with two other kids, to present him and Winnie Mandela with flowers upon arrival. It was later that same day, that our family marched in celebration with a large jubilant choir, across the massive football field in front of a crowd of 58,000, and were soon on stage. Mandela and his wife were then ushered in, and stood right in front of us. He delivered an electrifying speech in which amongst others, he thanked the University of California for divesting in companies doing business with South Africa, due to massive student protests across all U.C. campuses, especially Berkeley. Mandela then joined us as we sang together the then banned anthem “Nkosi Sikelel’ iAfrika.” Four years later in 1994 Nelson Mandela was inaugurated as president and Apartheid was officially abolished, a crucial moment in history!

Q How did growing up during the turbulence of Apartheid shape your values and impact you as a healthcare provider?

A From a young age I saw my parents help injured people on the road, rush people to the hospital, and nurse people’s mental and physical wounds. People always ran to the church minister for help, because they knew that an ambulance for a person of color would come several hours later, or not show at all. We met a young man named Morris whose mom told us he was so named, because he almost entered the world en route to the hospital in my dad’s Morris Minor. Growing up in an environment like this, I had the strong urge to be in a profession where I felt I could make a difference in people’s lives. I feel so fortunate that Berkeley more than adequately equipped me to make that difference.

Q You have recruited your brother out of the biotech industry to be your business manager. You have also hired some of our outstanding recent OD graduates. What tips can you share for recruiting and retaining talented colleagues?

A My brother Neil, took a leave of absence from the biotech industry to assist me in the office when I started, and I was so happy when he realized that though he enjoyed working in a lab, he preferred working directly with people, as we do each day in our dynamic Optometry field. He is a jack of all trades, so in addition to hiring and managing staff, he takes care of the many details that keep our two offices functioning efficiently. The best thing about Neil though, is that he keeps us all laughing. I’m sure if you asked any of the wonderful grads that we’re so fortunate to have worked with, they will tell you Neil’s comedy keeps them coming back. During this pandemic, I feel fortunate that we can still laugh with each other, six feet apart, with our masks on, of course. Seriously though, he helped me put together an amazing staff without whom I would not be able to operate. All I can say is that I’m blessed beyond measure!

Q What do you enjoy most about owning your own practice?

A I love the connection with people. Our team enjoys working together, and we all love seeing students who have come through our practice, become great optometrists. What I miss now, during this pandemic, is eating lunch together like we’re accustomed to. This is a time when we usually can connect with new staff members, or catch up with those who have been working together with us for many years. I enjoy getting to know my patients better each year. My most memorable was a 4 year old 18 diopter myope, who was struggling to keep his glasses on. I advised he be fit into contacts, and his mom was excited about the benefits it would afford him. I struggled as he kicked and screamed, while I tried to get a contact lens in his eye. With a very determined mom, we eventually laid him on the carpet, while she straddled him holding his legs and arms in place as I got the lenses in. To celebrate, we took him to the ice cream store close by. Seeing his reaction as he took in the world, was priceless. When I later removed the lenses, he pried his eyes open with his own little fingers, and asked me to please put them back in. I still look forward to seeing Darryn every year, now a 23 year old young man with a deep voice.

Q What were your first impressions of Berkeley?

A I fell in love with Berkeley the first time I visited. I was instantly attracted to this beautiful campus with its diverse staff and students. I feel so grateful that I had the opportunity to complete my undergraduate studies and Optometry at a place that I love so much. In addition, it is here that I built so many lasting friendships with people from all around the world.

Q You are a published writer! What books have you enjoyed reading?

A I have always been drawn to biographies or autobiographies because I learn so much from the experience of others, particularly those I admire. When we first left South Africa, I felt so privileged to be able to openly read books that were banned there, like Nelson Mandela’s “The Struggle Is My Life” and Winnie Mandela’s “Part of My Soul Went with Him,” though we dared not mention it in letters or phone conversations with our friends and family there. There’s been a whole lot more that I’ve enjoyed and the most recent book I read, that I couldn’t put down was “Haben, The Deafblind Woman Who Conquered Harvard Law,” by Haben Girma.

Q What is your spirit animal and why?

A Definitely the bear. Ursula is a diminutive of the Latin “ursa” or bear. I like the fact that bears are strong and determined, yet gentle and compassionate animals. My parents didn’t know the meaning when they named me, but I guess it must’ve been fate, as I was destined for Cal. Go Bears! :)

“I had the strong urge to be in a profession where I felt I could make a difference in people’s lives. I feel so fortunate that Berkeley more than adequately equipped me to make that difference.”
1950

**Tom Clark, OD ’51**, passed away at the age of 93 in May of this year. He holds the city record for longest-serving elected official with 46 years of public service as a city council member and mayor combined. He managed to do it all while managing a successful optometric practice in Los Altos, per his obituary which can be found online.

**Art Bossin, OD ’52**, celebrated his 99th birthday in the Encino home that he and his wife Lois, Cal ’51, built together. Lois passed away earlier this year, a few months before their 70th anniversary. Art’s classmates included Drs. Mert Flom and Ralph Moses, both who studied with him at UCLA before transferring to Berkeley where he met Lois at Hillel. Art and Lois had three children, four grandchildren, and five great-grandchildren.

The city of Santa Cruz, the Monterey Bay Optometric Society, and Berkeley Optometry lost a longtime volunteer leader in **John Daly, OD ’53**. John passed away peacefully on June 28, 2020. His obituary details his extensive community leadership roles with the BPO Elks, Kiwanis Club, Salvation Army, and local government.

Berkeley Optometry alumni shared many fond memories of their professor, **Darrell Carter, PhD ’57**, who passed away in January at the age of 95. Darrell joined the clinical faculty in 1964 and also served as Director of the Ocular Disease Clinic, Assistant Dean for Student Affairs, Director for the Special Refraction Clinic, and Chair of the Admissions Committee. After retiring to Glen Ellen, CA, Darrell was inducted into the Berkeley Optometry Hall of Fame in 2014. His obituary describes his extensive and accomplished family, including **Janet Carter, OD ’79**.

1960

Doctors of 1962 and 1963 wrote in with remembrances of **Manuel “Manny” Lopez, OD ’62**, who was the first Latino mayor elected in Oxnard, CA where he served 26 years on the City Council and also owned a private practice, one of the first Spanish-speaking doctors in the area. Manny was the son of a farmworker who in his campaign was backed by Cesar Chavez; his widow Irma noted in his obituary, “he speaks to the farmworker the same as he would to presidents,” including Reagan and Clinton, who he met in person.

**Lee Goldstein, OD ’66** and wife Marcia, Cal ’64, have welcomed the birth of their first great-grandchild on June 18. The couple has two children and four grandchildren. In retirement the Goldsteins have found the joy of RV-ing in the western US and Canada. Lee is a former COA President, COA Optometrist of the Year, State Board President, and a Berkeley Optometry Alumnus of the Year.

Congratulations to **Burt Worrell, OD ’68**, who married Manuela Russell in 2019! The happy couple live in Los Gatos, CA.

1970

2 | **Barry Winston, OD ’70**, welcomed a new furry family member during shelter-in-place. He is still managing a private practice and teaching at the school one day each week.

3 | **Siu G. Wong, OD ’70, MPH ’72**, dedicated her life to public health and public service. A memoir detailing her career as an optometrist was featured in the April 2020 issue of *Hindsight: Journal of Optometry History*. Her activism included a focus on Chinese American jurisprudence and its impact on American history and its legal system. This activism included raising funds for a monument to a landmark Chinese American civil rights case, Territory of New Mexico V. Yee Shun (1882). This court case affirmed Chinese Americans Constitutional right to testify in court. Her Class of 1970, celebrating their 50th reunion, was the first to graduate in the four-year OD program at Berkeley Optometry.
4 | Congratulations to Barry Weissman, OD ’72, PhD ’79, who was awarded the 2019 Dr. Richard Hemenger Faculty Research Award at the Southern California College of Optometry of the Marshall B. Ketchum University, in recognition of the quality, significance, impact, and relevance to optometry of his research contributions. Barry joined the SCCO/MBKU faculty in 2012 following his retirement after 33 years on the faculty of the Stein Eye Institute and Department of Ophthalmology, David Geffen School of Medicine at UCLA. Dr. Hemenger was an outstanding teacher and nationally respected visual scientist.

Connie Wang, OD ’78, is preparing to retire once she sells her one-doctor practice in downtown Concord, CA. Connie looks forward to spending more time with her loved ones, including three grandchildren.

5 | Davida Dong-Leong and Richard Leong, both OD ’78, took a three-week trip through South America, in February and early March, returning safely before shelter-in-place began. The highlight of their adventure was Patagonia, pictured here, and included stops in Santiago and Rio de Janeiro.

Johnny Jang, OD ’78, will retire from Kaiser Permanente on July 31, 2020 after 41 years of service as a senior optometrist. He plans to continue his involvement at the UC Berkeley Martial Arts program.

6 | Vicki Hughes, OD ’78, is thrilled about the appointment of Dr. Michael Drake, new UC President, and reminded us that he was a featured CE lecturer at Berkeley Optometry ~7 years ago. Photo from a mutual friend’s birthday celebration with Dr. Edward Collins, Bonda Lee, Brenda Drake, Esq., Dr. Michael Drake, and Charles Collins, Esq., President & CEO of YMCA San Francisco.

Ever since her sister moved to Santa Fe, NM, Janet Carter, OD ’79, was intrigued with the city. She found her dream vacation condo to be the perfect shelter-in-place home while she had a temporary break from practice. In Santa Fe, Janet has learned to cook New Mexican-style Hatch chile dishes. As her younger son went “to the dark side” as a busy hospitalist and assistant professor at Stanford Med, her next extended stint will be as the Granny Nanny for his twin sons due in late October! Her older son and wife are riding out the pandemic in Tokyo, Japan where they live. Janet wants to thank everyone who sent kind words after her father, Professor Darrell Carter, passed away earlier this year.

1980

Michael “Mike” Gatschet, OD ’82, died of a heart attack in July at the age of 66. Classmates, colleagues, and patients fondly remember his love of family, the outdoors, and Bay Area sports.

Jeff Calmere, OD ’88, sold and retired from his private practice after 30 years! For over 10 years, he was on the Berkeley Optometry Preclinic faculty, and later managed COLA, a laser vision correction co-management company of up to 650 doctors which sold to TLC in 2015. He is interested in returning to an academic or research setting. He and his Opto-love, Linda Hur-Calmere, OD ’90, still live on the peninsula. Linda’s practice includes seven (!) Berkeley Optometry graduates.

1990

Sharon Joe, OD ’90, and Greg Hom, OD ’91, celebrated their youngest daughter’s high school graduation and Girl Scout Gold Award in June. After three daughters and nine years of volunteering for numerous high school organizations, Sharon and Greg are looking forward to the next adventure. Both are still in practice in San Diego.

7 | The Asmus-Garcia family celebrated younger son Alec’s graduation from Miramonte High School. Their older son Derrick is studying at University of Redlands, where he is a member of the swim team. Pictured here: proud parents Paula Asmus, OD ’90, and Ron Garcia, OD ’91, with son Alec.

Hey Alumni!

Do you have a story to tell? About your career or your life? We’d love to hear from you! Send us pics and details.

optoalumni@berkeley.edu

Please visit our website to see more updates from our alumni!

optometry.berkeley.edu/alumni-notes
Bob Theaker, OD ’91, is the 2020 national legislation chair for the AOA! As chair of the Federal Relations Committee, Dr. Theaker works on legislation and regulation issues relating to optometry, and promotes the profession at the national level. Bob has also served as the COA President, President of Rotary, and still finds time to practice optometry with his partner in life/love/vision, Elizabeth Anderson, OD ’92, at Hollister Vision Center.

Todd Adair, OD ’92, and family have moved to Wichita, Kansas! After selling his practice a few years ago, he enrolled in a Masters of Healthcare Administration, MHA, at George Washington University and plans to shift into healthcare administration after graduation this December. While he will miss Sacramento, he plans to keep his license and keep in touch with classmates at CE events.

8 | Erik Zingler, OD ’96, participated in a 2-week medical humanitarian mission to Puerto Rico, addressing areas still recovering from the 2017 hurricanes. His site saw more than 1,100 medical and dental patients, 500 of which were seen by Erik and Puerto Rico VA colleague Maj. Alex Garcia. Total impact of the mission was an estimated $1.9 million in value to over 9,000 patients across six sites, with more than half of the dollar value in optometric services and eyewear.

2000

9 | Deana Lum, OD ’06 and her husband Michael Black are excited to announce the birth of their son, Darrin. Their oldest son, Ian, was ecstatic to become a big brother! Deana continues to practice at the VA Central California Health Care System in Fresno, California, where she is the chief optometrist and residency program coordinator.

10 | Low Vision aka “LOVE Vision” Boss Ladies: faculty members Marlena Chu OD ’08 and Cheyenne Huber OD ’11 with Low Vision Residents Jessica Broodryk, Emily Gorski, and Cristina Ta, with our iconic Campanile!

11 | Love Vision Social Distance Picnic Celebration! Low vision faculty with previous and current residents celebrated in El Cerrito, CA in June. With their loved ones, clockwise from the tutu: Marlena Chu (’08), Cheyenne Huber (’11), Kenny Tran (’18), Liz Barclay, Emily Gorski (’18 LV Rez), Cristina Ta (’20 LV Rez), Susana Chung, Jessica Broodryk (’21 LV Rez).

12 | Marina Rocchi, OD 11, married Jordan Hutton in an international celebration starting with a civil ceremony in California, and a wedding in Wicklow County, Ireland. In 2020 she was honored by the COA as a Young Optometrist of the Year, and a Keyperson of the Year at Legislative Day, an honor she shares with her father Steven Rocchi, OD ’81.

13 | Tiana Leung, OD ’14, and her husband, Chadwick, welcomed their baby boy, Oliver, in May 2020. They can’t wait to meet all the other 2020 and Opto babies once it’s safe!

14 | Berkeley Optometry is thrilled to welcome Ghazal Naseri and Joan Castañeda (not pictured), both OD ’19, to the Berkeley Optometry clinical faculty. As residents, Ghazal and Joan expanded their experience in Primary Care/Contact Lenses, and Ocular Disease, respectively. Welcome home, Doctors!

2020

New graduate Angelica Estrella, OD ’20, is moving to Las Vegas, NV with her Opto-love Brian Nasser, OD ’19. They look forward to serving the diverse population of patients in a mixed private practice/corporate setting together.

15 | Aubrey Vetrone, OD ’20, and her family have welcomed their baby girl, Eliyana Lisette into the world on the morning of June 16, 2020. Pictured here are Dr. Vetrone’s children, 7 year Kayden James and his new baby sister Eliyana (Ellie for short). Amidst all this COVID craziness, the new family of four are just trying to enjoy all the good that this year has brought them.
“As the need for primary vision care grows, philanthropic support is essential to Berkeley Optometry’s ability to advance clinical and research excellence, and usher in the next golden age of optometry and vision science.”

—JOHN FLANAGAN, DEAN AND PROFESSOR

Now is the time

Join us as we aim to raise $20 million for Berkeley Optometry by the end of 2023. Let us enter our 100th year of excellence in celebration of our unprecedented accomplishments. We look forward to sharing each and every success along the way.
Our Strategic Priorities

Our priorities include empowering Berkeley Optometry leadership with vital funding for our greatest needs & priorities. Your support provides a powerful means of ensuring our preeminence and leadership in optometric education, patient care, and vision science. Your generosity illuminates new possibilities for a better tomorrow.

Scholarships
We must enable our students to thrive in an environment conducive to learning, including financial security. The lower their financial debt, the more freedom our students have to be change-makers and pursue inspirational careers in all areas of vision care and research.

Academic Innovation
We must continue to develop our curriculum in order to prepare our optometry students and residents to deliver high quality vision care in a rapidly evolving health care system, enable vision science students to excel in discovery, and develop the leaders of tomorrow.

Vision
Uncorrected poor vision impacts 2.7 billion people worldwide, including 1.0 million children. Through direct care and international partnership, Berkeley Optometry will pave the path for pediatric vision correction across the globe, resulting in equality of opportunity, increased productivity and a program of change.
Invest In Our Vision

Dr. Maria Liu
The path to outstanding patient care and vision science research begins in our classrooms, labs, and clinics.

Learn more and make your gift online.
Optometry.berkeley.edu/give