

PENN at PIXAR

Alumni have been working at the icon of computer animation since long before *Toy Story*—when the company wasn't even called Pixar yet—and a steady stream of Digital Media Design graduates are continuing to help create new hits like the Academy Award-winning *Brave* and this summer's *Monsters University*.

By Molly Petrilla





From left: Paul Kanyuk, Nicole Grindle, Ana Lacaze Jordan, David Baroff, and Samantha Raja.

It's February 24, 2013. Oscar Night. On stage beside Paul Rudd, Melissa McCarthy leans into the microphone: "Here are the nominees for the Best Animated Feature Film."

The screen behind Rudd and McCarthy awakens. Bagpipes whine as a red-haired girl arches her bow and arrow. The digital crowd around her cheers as she shoots the arrow straight toward the camera and, in a close-up, whips her ample hair to the side, fiery curls bouncing and swaying. "Brave," McCarthy says, "directed by Mark Andrews and Brenda Chapman."

Four more animated films flash by. McCarthy names the title and directors of each. "And the Oscar goes to ..." Rudd draws it out, prying open an envelope. McCarthy peers over his shoulder and emits a small gasp. "... Brave."

Andrews and Chapman race to the stage while another clip rolls on screen, accompanied by a jaunty Scottish jig. This time the red-haired girl—Brave's main character, Merida—is clinging to a steep boulder, her wild hair and green dress flapping in the wind.

Despite McCarthy's gasp, there's nothing shocking about the fact that yet another film from Pixar Animation Studios, a subsidiary of The Walt Disney Company, has won an award. In fact, this is the seventh time a Pixar movie has won the Oscar for Best Animated Feature since the award was created in 2001. (For the record, *Finding Nemo* was the first to win.) The true surprise is how many animators, technical artists, and production managers it took to create the work that flashed by in those seconds-long clips—and how many of those contributors went to Penn. From the technology that enables Merida's dress to flutter and scrunch, to the large crowd standing behind her, to that springy red hair, alumni had a hand in each moment of Oscar footage.

Professor of Computer and Information Science Norman Badler, director and faculty advisor for Penn's undergraduate Digital Media Design program (and an old friend of Pixar co-founder Ed Catmull), estimates that Penn has been sending one or two graduating students a year to the revered animation studio. They join still more alumni who have already been working there for years—some since the mid-2000s, others for multiple decades, one since the company's earliest days.

"The relationship between Penn and

Pixar is very strong and we're very thankful for it," Badler says. "I know [Catmull] recognizes that Penn has supplied some very capable folks for his team."

David Baraff EAS'87, a senior animation scientist at Pixar, was on his way into work one morning when he noticed something odd. He'd been striding through the company's central outdoor area, as he did every day, when a large mass caught his eye. Glancing up, he saw an enormous hot-air balloon. There was a full-size sofa attached to it and, strapped to that sofa, a newscaster was midway through a broadcast about the Pixar film *Up*.

"That's when you shake your head," he says, "and say to yourself, 'Okay, it's just another day at work.'"

"I sort of take for granted that every few weeks some weird, random thing is going to happen on campus and I'll get to watch it," Samantha Raja EAS'10 GEng'11 says of working at Pixar. The University of California, Berkeley marching band once showed up and played their way through the company's halls. Another day a petting zoo appeared outside. "I'm sure that some department somewhere had need of a petting zoo," she adds, "but everyone else just went outside and played with the animals."

Celebrity sightings are routine, though employees are warned not to approach any of the famous faces. "We just watch from a distance and then tell each other, 'Omigosh! I saw Shaq today!'" Raja says.

Baraff recently went to a meeting in which an employee from each in-the-works film stood up to discuss its status. Actor John Goodman—the voice of Sullivan in *Monsters, Inc.*—"just appeared out of nowhere," Baraff says, to offer an update on the sequel, *Monsters University*. "That's just a day in the life here," he adds.

But even amid the celebrity run-ins, the foosball battles and the cereal bar, the larger-than-life Buzz Lightyear made of Legos, actual work happens—enough work to employ more than 1,200 people. Oscars don't win themselves, nor do animated movies gross billions of dollars without help from a vast team of artists, storytellers, and technicians.

One of those technicians, Ana Lacaze Jordan EE'97 FA'97, jokes with her husband about tracking their lives by the Pixar films they've worked on. They've both been

with the company since 1997. "We'll say, 'We got married during *The Incredibles*,' or 'We did this during *Toy Story 2*,'" she remarks. "It's kind of funny that we match up certain times in our lives that way."

As a shading artist, Jordan brings objects and characters to life by giving them color, texture, and shine. "When [computer-generated] props or characters come to us, they just look like white plastic," she says. "After shading, they look like what they're supposed to: wood or dirt or plastic or skin. We figure out if something is shiny, if it's opaque, if it's wrinkled, if it's transparent, if it glows, if it's waxy."

In the 2009 film *Up*, Jordan shaded the main character, Carl, whose skin transforms from pale and sickly at the beginning to a youthful tan by the end. She knows the transition is so subtle that audience members may not even notice it, but then again, "if the audience doesn't notice [the shading] I do, then I've done a good job," she says, "because that means it looks real."

Yet in Pixar World, human characters are rather rare, so Jordan can't always rely on complexion to reflect personality. In *Cars 2*, she shaded several of the film's vehicular characters, revealing their past lives through their rust patterns.

She sat at her computer every day for several years, surrounded by reference photos: East Coast rust, West Coast rust, upper-facing rust, rust from snow, rust from seawater. "You start figuring out that this character is going to be mostly rusted on the top because of rain and that character gets more mud and maybe has more rust on the bottom," she says. "Then you start figuring out how rain rust might look different from rust from mud or snow. What is the pattern it leaves? Which places in a car would you see that?"

It's immensely detailed work, but "I tend to be attracted by details," Jordan says. "I like figuring out what makes things work, what makes things the way they are."

Along with Jordan, at least half a dozen Penn graduates currently work as "technical artists" at Pixar—a broad job category that the company sums up in a single sentence: "Our fantasy worlds look so real you could touch them, thanks to the light and shading, crowd and effects, and much more provided by our technical artists."

Remember that image of the Disney cartoonist, hunched over a drafting table,

producing sketch after sketch of Mickey Mouse? There may be shades of that in the Pixar art department, but a technical director's job relies on advanced technology, trading in colored pencils for powerful computers.

A technical director ideally has “a strong aesthetic vision but also knows the fundamental principles of computer graphics and how to do programming,” Raja says. She uses a physics-based computer simulation program to create and control the way a character's hair or clothes move. Once a director sees the

In the middle of Pixar's sprawling campus in Emeryville, California, a 43-foot-tall desk lamp stands beside a super-sized yellow ball with a red star and blue stripe.

For anyone who's seen a Pixar film, the tribute is obvious. The lamp appears at the beginning of each movie, bouncing on a ball that suddenly bursts, then turning its lamp-shaded “head” to look sheepishly into the camera.

But even before that, the lamp starred in the company's first animation, *Luxo Jr.*—a two-minute short from 1986 about

“[Lasseter] had felt inspiration strike when Tom Porter [C’72] brought his infant son into work one day and Lasseter, playing with the child, became fascinated by his proportions. A baby’s head was huge compared with the rest of its body, Lasseter realized. It struck Lasseter’s funny bone and he began to wonder what a young lamp would look like. He fiddled with the dimensions of all the parts of his Luxo model... and he emerged with a second character, Luxo Jr.”

Tom Porter has been at Pixar for so long that he's often asked to reminisce about its earliest days for books and documentaries about the company. He arrived in



default simulation, he'll often decide that things should look a little different and Raja will summon her computer science expertise to start “playing with the parameters,” making a hair toss last longer or a patch of fur stand up straighter.

As a technical director who helped animate hair and fur for *Brave* and *Monsters University*, Raja says her work feels important. At times, it's almost felt *too* important.

“In the beginning, I got really stressed out because I knew if I made a mistake and no one caught it, it would be there for millions of people to see and then it would live on forever in the DVD,” she says. “But I've sort of gotten over that. I'm okay with the pressure now.”

a large “adult” lamp and a smaller, “young” one. The baby Luxo lamp is iconic at this point—enough of a mascot for Pixar to justify the towering replica—and the inspiration behind it has a Penn connection. John Lasseter, now the company's chief creative officer, came up with the idea one day thanks to an alumnus-employee and his visiting baby. As David A. Price explains in *The Pixar Touch*:

1981, more than a decade before Buzz Lightyear flew or Nemo swam, and even before the group was called Pixar. Back then, it was the Computer Graphics Division at Lucasfilm, *Star Wars* creator George Lucas's production studio.

When Apple co-founder Steve Jobs bought the Lucasfilm offshoot in 1986 and turned it into an independent company, Porter became one of Pixar's first 44 employees.

Though he was unavailable for this article, in an interview with *The Exeter Bulletin*, Porter revealed that a Penn professor unintentionally guided him away from further studies in math, which he majored in at Penn, and into the world of technology. “He told me, ‘Computers are going to be big,’” Porter reportedly said with a chuckle. He went on to study computer science at Stanford before landing at Lucasfilm.

Along with Catmull and several of his Pixar peers, Porter won the Scientific and Engineering Achievement Academy Award in 1993 for their RenderMan software. By then, RenderMan had helped filmmakers create computer-generated visual effects for *Jurassic Park*, *Free Willy*, *The Abyss*, and *Batman Returns*. When Pixar released its first feature-length film in 1995, Porter’s name appeared in the credits. He had supervised *Toy Story*’s shading and, using RenderMan, also its visual effects.

“Sure, the humans didn’t look great and there were other issues,” Porter told the author of *To Infinity and Beyond! The Story of Pixar Animation Studios*, “but we were pretty much able to get the film that we all wanted.”

That same year, in the midst of the *Toy Story* frenzy, Nicole Grindle C’83 arrived at Pixar for her first day of work. She had been hired to oversee production of the *Toy Story* Activity Center—“a CD-ROM with a bunch of computer games based on the *Toy Story* world,” she says. “It seems so primitive now. It’s funny to talk about.”

Once the new game disc was in kids’ computers, Jobs—then president and CEO of Pixar—“decreed that it didn’t make sense for us to do that kind of game development at Pixar,” Grindle says. She moved over to managing the company’s films, overseeing production for *A Bug’s Life*, *The Incredibles*, *Monsters, Inc.*, and *Ratatouille*. More recently, she associate produced *Toy Story 3* and *Monsters University*, which opened in theaters in June.

Grindle recalls “just inventing everything as we went along” during the mid-1990s at Pixar. There were only about 100 employees and “we were creating our own process for everything, and it was *hard*,” she adds. “We worked really long hours.”

As for the notoriously temperamental Jobs, “he inspired you to do great things,” she says. “He was very demanding, so you didn’t want to disappoint him. You wanted to be sure you always said the

right thing to him and surprised him—that you were honest and creative.”

She also remembers the champagne. It flowed frequently when Grindle first came to Pixar because there were so many milestones to celebrate: *Toy Story*’s theatrical release, then its glowing reviews, then its \$192 million domestic box-office gross. “I thought, Oh goodness, what a place to work!” she says. “Since then, I’ve had a lot of champagne at Pixar, year after year” as the successes continue rolling in. The company now leads the animated-film market with 30 Academy Awards and more than \$7.7 billion grossed at the worldwide box office to date. As Grindle sees it: “It’s been an amazing ride—an amazing 17 years.”

By 1998, Grindle, Porter, and Jordan were each immersed in their roles at Pixar and the company was beginning work on its next film, *Monsters, Inc.* The movie presented new technical challenges, including a big blue-and-purple monster covered in soft, hair-like fur. The fur had to blow in the wind and stand on end. It had to get drenched and be shaken dry. It had to look *real*.

After graduating from Penn, David Baraff had gotten a PhD from Cornell and joined the faculty of Carnegie Mellon University as a professor of robotics. He’d been working on hair and fabric simulation technology for several years, co-founding a company called Physical Effects, Inc. It was his fellow alumnus, Tom Porter, who sought Baraff out for Pixar.

The company soon hired him to research and develop cloth and hair simulation technology for its newest film. Back then, “the challenge was simply to make anything work,” Baraff recalls. Along the way, he created the first simulated garment to appear in a feature-length movie—a shirt for the toddler character, Boo—and helped bring monster Sullivan’s fluffy blue mane to life.

Since *Monsters*, Baraff has continued to develop and refine the technology that clothes Pixar characters and that lets their hair—or fur—move freely.

“He is the father of the simulation department here,” Samantha Raja says of Baraff. “Whenever we have [technical] problems, we’ll file a report and he’ll fix it. He fixes things within an hour, easy. He’s like the mastermind, always fixing things or creating new tools or giving demos for the tools he created.”

Just as Porter had a decade earlier, Baraff won the Scientific and Engineering Academy Award in 2006, sharing it with two others for their combined work in cloth simulation. But while Porter and Baraff both held prominent, even award-winning positions at Pixar, for years they were among only a handful of employees with Penn degrees.

That’s recently started to change.

Of the current alumni-employees at Pixar, more than half graduated after 2004. A number of recent grads and current students have interned there, including Karl Li W’13, Joseph Tong EAS’15, and Zia Zhu EAS’14 this past summer.

Asking about Penn’s budding relationship with Pixar, one name kept coming up: Paul Kanyuk EAS’05. “All of us considered Paul a god, basically,” Raja says.

“He’s a bit of a legend,” Li adds. “His senior design poster is still on the wall. His name definitely gets mentioned a lot.”

“Paul paved the way for Penn at Pixar,” Norm Badler says. “He proved you could become a very effective technical director with an undergraduate DMD degree from Penn.”

Back in the late 1990s, when Badler created the Digital Media Design major and Amy Calhoun became its associate director [“The Cult of DMD,” Sept/Oct 2003], they often heard the same refrain from animation companies: *We don’t hire undergraduates for technical jobs*. Never mind that the DMD program was producing “a new generation” of computer graphics experts who had studied computer science, fine arts, and communications.

“The expense and the time to do computer graphics 15 years ago pretty much guaranteed that you had to have a PhD to do anything in that world,” Calhoun says. “As the years went by, part of my job was to explain to all these companies that things had changed. It took a long time to convince people who all had PhDs themselves that my little undergraduates could compete in this world. Paul Kanyuk was the one that completely changed their minds.”

Kanyuk arrived at Pixar in the summer of 2004. He’d been selected for a six-month internship, in part because of his “technically proficient but horrifying” demo reel, as Calhoun describes it—an animated, screaming skull that spun on a turntable while German heavy metal played in the background. Light reflected in its eyes and teeth.

“What Paul didn’t know at the time,” she adds, “is that they were working on *Cars*, so reflective surfaces were really important to them.”

When Kanyuk finished his first week as an intern, Calhoun got a phone call from his managers. “They said, ‘We gave him these assignments thinking *That’ll keep the little tyke busy for a while*, but he came back at the end of his second day and he’d done everything we gave him,’” Calhoun recalls. “I said, ‘I told you he’s smart!’”

She suggested they put Kanyuk in charge of Pixar’s RenderMan phone support line. “There was a huge backlog of questions,” she adds, “and Paul got rid of it in a week. Within two weeks, [Pixar] knew they wanted to hold on to this kid. He really changed everything for us.”

By the end of his internship, Kanyuk had an offer from Pixar to return full-time after graduation and Calhoun was getting calls from the company asking if Penn had “any more like Paul.” Though the DMD program was seven years old at that point, Kanyuk became its first graduate to land at Pixar. He’s been there ever since, first shading chipped paint, rust, and dust for *Cars*, then rendering crowd shots for *Ratatouille*, *Wall-E*, *Up*, *Brave*, and *Monsters University*.

“Because [Pixar] had hired someone they were happy with, we started to appear on their recruiting radar,” Badler says. The company began sending Kanyuk back to Penn once or twice a year to interview other DMD students and tell them about his work. “He knows the program, he

knows the school,” Badler adds. “He can be an advocate for us as well as for Pixar.”

Several recent graduates, including Samantha Raja, had their first Pixar interview with the now-legendary Kanyuk. “Pretty much everyone [at Pixar] from Penn, I recruited,” he says—a list that includes fellow technical directors Matt Kuruc EAS’08, Nancy Tsang EAS’09, Ariela Nurko EAS’09, Emily Wehrich EAS’10, and Raja. Getting one or two students into Pixar every year is significant, Badler says, since the DMD major has only 20 or so students in a graduating class.

Once the computer-animated gate into Pixar had been pried open, Calhoun realized that “I just have to get one [DMD student] in the door everywhere, and then everything changes,” she says. In addition to Pixar, DMD alumni are currently working at DreamWorks Animation, the game company Zynga, The Walt Disney Company, Google, Facebook, Electronic Arts, and more. As Karl Li puts it: “Pixar is not a one-hit wonder for DMD.”

But it’s still the most sought-after wonder. “Pixar has a certain stature because of the small number of gems it produces and the particular ways it pushes technology in interesting directions,” Badler says. “I certainly think it’s the premiere destination for our alums, but not every DMD student wants to work in the motion-picture industry.”

“I think what’s most interesting about Pixar in comparison to any place I can think of is that the awe lasts longer,” Calhoun adds. “The feeling that they really are making magic continues for a long time. Our alumni are really proud of what it is they’re creating. [They] are practically swirling around in a world of delight, like, *Can you believe they pay us to do this?!*”

Nicole Grindle has been thinking about her Penn days a lot lately.

She associate produced *Monsters University*, which chronicles the *Monsters, Inc.* characters’ college years. “We always embrace the theme of the movie we’re working on,” she says, and for *Monsters University* that meant a college sweatshirt day, a special-issue Frisbee to toss around, and even an employee yearbook.

“For me, there’s an emotional resonance,” she says of the film. “There’s that feeling of striving so hard and wanting so badly to figure out that you’re good at things. That’s what really resonates for me.”

When Grindle left the bioengineering major at the end of her freshman year, “I felt like such a failure at first,” she says. But then she found Bloomers. She joined the all-women musical and sketch comedy group her junior year and was soon asked to direct the next spring show.

“I was terrified,” she recalls. “I think my stomach hurt for the entire year after that.” Still, in the spring of 1983, her name appeared under *Director* for the show *All Nonsense*. It included a “Broken Family Feud” sketch with the cast of *Kramer vs. Kramer* battling the cast of *Ordinary People*—“including the dead son,” Grindle adds with a laugh.

“It’s always really scary starting a new project here,” she says of her current work. “But that fundamental experience at Penn gave me faith that I could pull anything off. Working with Bloomers probably contributed the most to where I am today.”

While Samantha Raja’s college days ended only a few years ago, she also finds frequent reminders of Penn at Pixar. She’s surrounded by other recent DMD alums and, especially at the beginning, “it was nice to have familiar faces,” she says. “You sort of forget you went to Penn together because now Pixar is your common ground. But every so often you’ll say, ‘Hey, remember that thing that happened in Philadelphia?’ and everyone does.”

For Raja, Pixar is The Dream Job—the place she fantasized about working since watching *Ratatouille* as a teenager. Two years in, she still takes the long way into work every morning just to pass under the giant Pixar sign.

“I think that for an awful lot of students who come into computer graphics, the magic of the movies is the thing that inspired them to study this in the first place and that motivated them through the really hard parts,” Calhoun says.

“There are parts of the computer-science curriculum that are just difficult. To be sitting there in the computer lab at 2 a.m. on Hey Day when you know that all of your friends are out, there has to be something that’s motivating you. For my students, the motivating factor is *But someday I could work at Pixar*. That was the thing they always wanted to do, and they believe that by going through the DMD program they’ll get it. And they usually do.” ♦

Molly Petrilla C’06 write frequently for the *Gazette* and oversees the magazine’s arts&culture blog.

ON THE WEB | “*Buzz Lightyear saved my life*,” writes Alec Sokolow C’85, one of the screenwriters credited for *Toy Story*, the beloved 1995 film that put Pixar on the map and forever changed our expectations of animated films, spawned two smash-hit sequels and moved uncounted millions of related merchandise, and created an iconic comic duo in space-ranger Buzz and cowboy Woody.

In “*My Toy Story*,” available only at our website, Sokolow tells how the news that he and his writing partner had been hired to work on the film—then little more than the concept “*Two toys. One Boy*” and the title (which was “deemed uninspired,” but stuck anyway)—helped jolt him out of grief at his father’s death and sustained him through some of his darkest days both personally and professionally:

“[W]hen all hope seemed lost and my very ability to press on seemed to hang in the balance, *Buzz Lightyear* somehow magically swooped in and rescued me from the depths of personal loss. Threw me a lifeline. Led me out of the darkness to the light. To safety and hope. To infinity and beyond.”

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