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CLIPS

1. Journalism
    a. "The Legacy Remains as Hardimans and Redwood Part" — long-form feature piece profiling a family business (print version PDF included, click here to view online)
    b. "Earthquake in Ecuador: a student shares his story" — narrative news piece based on first-person account of an earthquake survivor (print version PDF included, click here to view online)
    c. "The Hidden Roots of Redwood: Tim Mullery's Journey" — long-form feature piece profiling a custodian (print version PDF included, click here to view online)
2. Video Production
    a. "3 Principles for Starting Over" — a video project documenting my move to New York (click here to watch on YouTube)
    b. "Project Rewind" — a video essay about the fallibility of memory and the process of digitizing over 100 hours of 8mm home video: how and why to do it (click here to watch on YouTube)
    c. "A Gift for a Friend" — a video about building an Altoids-tin-sized circuit board with push buttons and an LCD as a gift (click here to watch on YouTube)
    d. "1 Week 7 Sketches, Ep. 1" — short content on YouTube Shorts, a weekly sketchbook diary (click here to watch on YouTube)
    e. "1 Week 7 Sketches, Ep. 2" — short content on YouTube Shorts, a second weekly sketchbook diary (click here to watch part 1 on YouTube) (click here to watch part 2 on YouTube)
3. Fiction
    a. "Waiting for Fireworks" — memoir short story and accompanying reflection (print version PDF included, click here to view issue online)
4. Graphic Design
    a. "Graduation" — newspaper cover image (print version PDF included, click here to view online)
    b. "Trump" — newspaper cover image and accompanying center-spread data analysis story (print version PDF included, click here to view online)

5. Technical Writing
    a. “Learning to Walk: Legged Hexapod Locomotion From Simulation to the Real World” — excerpts from M.S. thesis (PDF included, click here to view online)

THE LEGACY REMAINS AS HARDIMANS AND REDWOOD PART

by Maxime Kawawa-Beaudan

Some days, they're everywhere: black hoodies dotting the halls, worn by seniors, juniors and sophomores alike. In orange text, they read, "Trenchless Titan." They serve as advertisements for the company by the same name, and the Redwood family that founded it, the Hardimans.

Most students at Redwood know the name Hardiman; after all, the school and the family are inextricably intertwined. Six Hardiman children—Sean, Kevin, Brendan, Eilish, Liam and Declan—have come to Redwood. Their mother, Melissa, attended in the '80s. But the Hardiman story (the Irish half of it, at least) started far from Larkspur, in the bogs of County Galway, Ireland. There, in a little town called Attymon, Gerry Hardiman worked alongside his father, who maintained the machines used by a government-owned company, Bord na Móna, to dig up a heating fuel called peat.

From a young age, Gerry worked amid the enormous engines of his father's trade: the baggers, bulldozers and turf-cutters. He drove locomotives, cleaned drains and moved railroad tracks. In his free time, he played a game called hurling, the national sport of Ireland. He played well—so well, in fact, that he was recruited by a hurling team in America, the San Francisco Gaels. He arrived in San Francisco in 1986, a young immigrant with nothing but an invitation from a regional sports club.

Later that year, he met Melissa Ross, a California girl who'd lived in Larkspur all her life. After finishing the sports career that had brought him to the United States, Gerry worked for a contractor who installed large sewer pipes, storm drains and water lines for municipalities. It was similar to some of the work he'd been doing in Ireland as a teenager, and in 1988, Gerry got his own contractor's license and set up his own company. That same year, Melissa and Gerry married.

Since then, the Hardimans have built their enterprise and a family of six children. They've juggled two sets of roles: parents and business owners. The outside of the Hardiman house speaks volumes about this balancing act, and how the two spheres overlap.

Parked on the curb outside of the suburban Larkspur home are three heavy-duty pickup trucks. In the backyard, power tools lie where a play structure once stood. The backyard separates the main house from a stand-alone, one-room office where Melissa and Gerry base their operations.

When the company began, in the late '80s, the back office housed just two desks: one for Gerry, one for Melissa. They worked on huge, multi-million dollar projects, mainly on public works for cities that took them everywhere from Santa Cruz to Sacramento. The work site was miles away, and the kids had their playground.

"Our backyard was very self-sufficient. In the olden days it didn't look like a work yard. This was the neighborhood house. The kids would come here and play. They would crawl all over, and I had toys and Johnny Jump Ups," Melissa said.

While the formative years of the company left the house largely free of clutter, the job left little time for leisure. The Hardimans were working long hours, day after day, all the while balancing their multitude of roles: crew chief, boss, husband, wife, father, mother.

"I worked between the hours of nine and two, and when the kids were off of school I was their mom, and they went to bed at eight and I came out here and we'd work," Melissa said.

Photo by Maxime Kawawa-Beaudan

LEADING A TEAM of workers on the job site, crew chief Sean Hardiman pauses to take a break

All that work paid off. Hardiman Construction started growing. The company fixed pipelines, built foundations, erected houses, shored up retaining walls and put in storm drains. And one day, the Hardimans decided enough was enough.

"We were working too hard. We needed to take our kids to soccer practice, to soccer games," Melissa said.

They shifted their focus to more local jobs, so that Melissa and Gerry could stay closer to home. They became more of a self-described 'mom-and-pop shop.' By this time, the kids had grown. The eldest Hardiman son, Sean, had just graduated from high school. Sean joined the construction team, and was soon running a crew of his own. In a natural progression, family and company became further intertwined.

Photo by Maxime Kawawa-Beaudan

CRACKING OPEN THE road with the excavator, Brendan (left) and Gerry (right) discuss how best to execute the manuever.

Of course, everyone in the Hardiman household had been involved with the tools of construction long before this. All of the boys had learned to drive the machines and operate power tools. They learned to use backhoes and run excavators, tow trailers and drive trucks.

"I was just running with the crew. Sometimes I'd have to go out and cut open the road so we could actually dig down to the pipe. Other times, we'd come through after and pull the pipe through," senior Declan said.

The Hardimans have built their enterprise and a family of six children. They've juggled two sets of roles: parents and business owners.

Soon enough, many of them were signing on for real.

Kevin, the second-oldest son, graduated from school at the University of California, Los Angeles in 2015. Melissa and Gerry were overwhelmed with smaller, local jobs, and the paperwork that came with them. Kevin came in to help with bookkeeping and payroll.

Brendan graduated from Redwood and took up a leadership position as a crew chief. Eilish returned from Cuesta College in San Luis Obispo and took a desk in the office, helping with the accounts receivable and accounts payable. Liam worked during the summers.

Over time, the Hardimans built a community of workers extending into Redwood itself. Many of their children's friends eventually found a place in the company. Declan and his friends Nick Calzaretta, Jackson Holscher and Wiley Geiger, current Redwood students, signed up to work during the summer.

Today, around the Redwood campus, this connection with the company and the family appears in the Trenchless Titan hoodies, which friends of the Hardimans, along with students who have worked on their sites, sport in the halls.

Trenchless Titan, Hardiman Construction's sewer repair company, started in 2009, under the guidance of Sean and Gerry. While the Hardimans didn't develop the trenchless method of sewer line replacement, they were the first in Marin to adopt the new method. Normally, installation involves digging a trench from the house to the street. The trenchless method uses specialized tools to pull a new pipe through the old pipe, pushing the old out of the way.

Sewer line replacements occur more frequently in Marin than one might imagine. Recently, the local sanitary district passed a new mandate requiring people selling, remodeling or buying a house to inspect their sewer lateral. The mandate has brought a great deal of business to the Hardimans from Marin.

"Most of the sewer lines around here are about a hundred years old, or fifty or sixty. They're often defective or in bad condition," Gerry said.

If the pipes fail a pressure test, they have to be replaced.

"It's not like a new beautiful backyard or patio. It's not aesthetically lovely. Twenty bucks says most people don't even know that they have a sewer pipe," Melissa said.

In this way, much of the work the Hardimans do goes unnoticed. When they do their job well, no beautiful verandas or glossy wood floorboards are left in their wake. They're the behind the scenes players of the construction world—as invisible as they are integral.

As the company and the children have grown, they've left an indelible mark on the community around them. And even as the last child, Declan, graduates this year, the family name won't fade from these halls. After all, the Hardiman house and office lie a mere five-minute drive away from where mother and children went to high school.

The Hardimans are just around the corner.

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Earthquake in Ecuador

A student shares his story

By Daniel Oh, as told to Maxime Kawawa-Beaudan

The town of Puerto Lopez faced the ocean on the western coast of Ecuador, a three-hour drive from Quito. A group of students played soccer on the beach, and across a cove from the beach was a mountain; beside it the sun dove for the water. The sky went orange, went green, finally crept toward indigo. Sailboats, fishing boats and canoes stood silhouetted on the ocean, bobbing with the breeze.

Some Redwood students and two teacher chaperones lazed around their hostel, a two-story wooden building hidden by overgrown trees. They sat on swings and hammocks watching the students kick their ball over wet sand, into the surf, sometimes into the waves. The soccer players and spectators had just come back from the street market.

It grew dark—dark enough that the students couldn't see the ball. They trudged up the beach to the hostel to have dinner and clean up. They'd already packed the night before. Tonight was about savoring their last hours in Ecuador. For many it was nostalgic; they'd made good memories and new friends with students at Fanny De Baird, a high school in the coastal town Bahia de Caraquez: Yair, Luis, Jeicol, July, Yanina and many others. Yair wore his hair long under a baseball cap that he'd bought on a trip to California a year ago. Luis was a surfer with short curly hair. He spoke the best English of the Fanny students.

As the Redwood students reminisced about their times with their new friends, one student, Daniel Oh, was in the shower. He was still there when the earthquake began.

This is their story, as told by Daniel.

The power went out. Someone screamed. 'It's just a power outage,' I thought. Although I couldn't see anything and was disoriented from the dark, I didn't shut off the water because I didn't think much of the outage.

Then I became dizzy. It felt like someone had spun me around 10 times, and the darkness only made the disorientation worse. I put my hands out, holding onto the tiling on the walls. I thought I was fainting. After three seconds, I recognized that it was an earthquake.

The room didn't shake. It rolled. It sat at the top of a long wave, dipped to its minimum, rose again. I started counting the seconds aloud: One, two, three…

'I hope a beam doesn't fall on my head,' I thought. I should've sat down and covered my head, but at the time I was frozen. I was calm, yet I couldn't think.

When I'd counted 12 seconds, I heard frantic voices moving past the door in the hall. It was impossible to tell in the dark whether the earthquake had passed.

"Is someone in there?" a teacher's voice called through the door.

"Yes," I said. I grabbed my towel and opened the door. The hallway was dark. When I stepped outside I was one of the last to arrive on the street. The students were in a huddle on the other side of the road. Groups of two and three consoled each other.

What I remember most amid all of this was my unsettling calm. I wasn't holding anything back; there was no panic to hold. Wasn't I supposed to feel something more?

We were lucky enough to be physically untouched.

The teachers retrieved our things and loaded us on to a bus at 8 p.m. Originally we had intended to leave Puerto Lopez at 11 p.m. to reach the airport in Guayaquil at 3 a.m. By a stroke of luck, the bus driver happened to be in town when the earthquake hit.

Most of the lights were out in Puerto Lopez and we could see the teachers and GSE leaders outside, gathered in front of the hostel under the orange light of their headlamps.

One of the GSE leaders stepped onto the bus. She gathered our attention and told us that a family who had initially planned to stay at the hostel needed a ride with us. They were in tears, she told us, over their luck in finding a ride.

For the next six hours, we sat on the bus. Our route took us through rough roads strewn with potholes and bumps and debris. Teachers told us that we couldn't stop the bus under any circumstances. People had to urinate so badly that they began to pee in a bucket.

When we got to the airport, I saw ceiling panels caved in around a support beam. Chairs were in disarray. Trash littered the first floor. Debris had fallen from the second floor to stores on the first. We sat at the airport for at least 10 hours, and together we watched the skyline lighten through the clouds. We stayed in the checking line for four hours; it was there that we found out that the house we had slept at in Bahia, named Casa Gorda, was still standing, but the town had suffered structural damage. One of the leaders started crying when she heard the news. We boarded the plane and left.

Copa Airlines took us to Panama City. We drove from the airport to the Riu Hotel, a five-star hotel. We'd left burnt out lights and tearful families only to find ourselves amid high ceilings, sushi bars, decorative fountains, swimming pools and computer lounges. But I didn't acknowledge this thought until the group dinner buffet when it entered the forefront of my mind. The 24 of us had left untouched. No scratches, no bruises. The buffet table was laden with fruit, chicken, pork, rice, corn, salads, and we'd left with nothing more than sunburns.

Over the course of the trip, the death toll had jumped from 77 to 200, from 200 to 300. The numbers gnawed at me. One could be Yair. Or Luis. Or any other of our friends. I didn't feel lucky. I felt guilty for leaving, and at the time, I wished I'd gotten hurt. I wished a log or a beam had fallen on my arm. There would've been some justice in it.

During our second day at the hotel, we learned that the Fanny students were unhurt. Some of their homes had been destroyed, including Luis's. After two nights, we left. At 8:50 a.m., we boarded a plane to San Francisco.

The return to school was tough. I felt a profound lack of purpose. Everybody knew, yet nobody seemed to care. The questions I got were mostly about the earthquake, not about how I felt, or the people we'd left behind. Class seemed unbearable, pointless. People like Luis struggled amid the rubble of their broken homes, fought to find shelter and food; our friends were mired in a disaster zone. Yet we sat in class watching videos, filling out worksheets. Nobody seemed to care.

I wanted people to feel how we felt, to see how much and why we wanted to help.

We came back shaken but unharmed. We made great memories and great friends. We played on beaches in the sunset, planted trees, snorkeled in the Pacific, met with the students from Fanny. We met local children like Javier, the 8-year-old son of one of our mentors, and local seniors like Don Ramon, the 80-year-old who can do 25 push ups on his fists and wields a machete like a warrior.

But we were only ever visitors to that place. The friends we made and the people we met live there. Some will live there for the rest of their lives. And what we do today determines whether they will live in ruin or in comfort.

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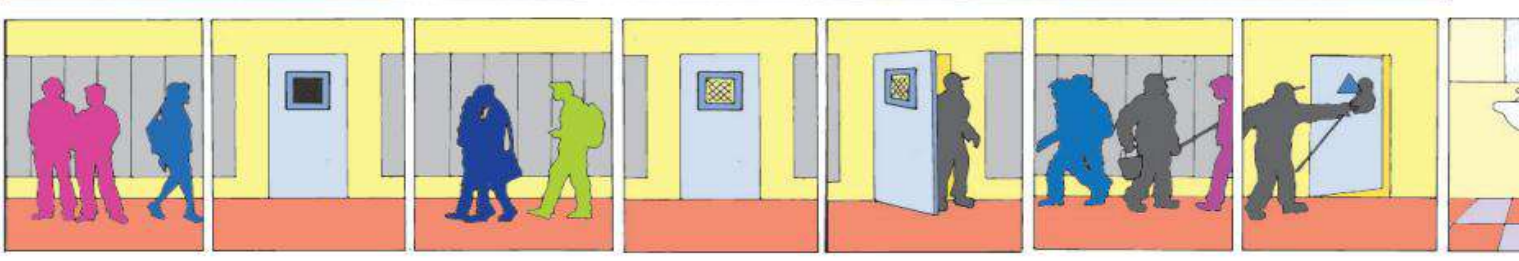
Photos courtesy of Jennafer Schoonover and Elly Lundberg

Redwood students and chaperones were in Puerto Lopez when a 7.8 magnitude earthquake struck Ecuador.
TOP: Andres (left) and Ismael (right) are snapped enjoying a mid-day snack. The boys live in Bahia de Caraquez.
SECOND: Senior Elly Lundberg poses for a photo with a young boy.
THIRD: Junior Tim Peterson holds a boy on his shoulder as Andres and his friend sit on a donkey.
BOTTOM: The service group poses with friends from the trip before departing.

The GSE students have set up a GSE donation page at empowered.org. Money will go to the restoration of Bahía de Caraquez, the town in Ecuador where the students stayed. The Redwood student band "Canopy" will also be performing at the Sweetwater Music Hall on June 19 in support of earthquake victims.

THE HIDDEN ROOTS OF REDWOOD: TIM MULLERY'S JOURNEY

Photo by Maxime Kawawa-Beaudan



BY MAXIME KAWAWA-BEAUDAN AND MICHAEL BENZ

Most days there was food in the fridge. Most nights of Tim Mullery's youth, when he returned from school, there was something on the dinner table. Some nights there was nothing, but that was life in Fairfield, a blue collar town marked by that red neon sign arching over Texas Street that had been hanging since 1925 and read "Fairfield, County Seat Solano County"a town of Clorox bleach factories and Budweiser breweries, three miles from the hulking gray C-17 Globemasters and C-5 Galaxies parked row on row on the tarmac at Travis Air Force Base. It was where Mullery's family called home.

Now, Mullery serves as Redwood's lead custodian, directing the team housed in room 160. At 34, he stands 6 feet 4 inches tall, an auburn beard stretching all along his jaw and cheeks. Everything from his teal uniform's shirt sleeves (rolled up to the elbows) to the beige chamois work boots he wears speak of long to-do lists. It takes a wide variety of skills and a vast breadth of practical knowledge to be lead custodian; Mullery is perpetually on call to replace ceiling tiles, inspect malfunctioning equipment and manage his team's operations. For the maintenance of Redwood's facilities, he's the first line of defense, and through it all, he's shaped by the teenager who grew up in a town whose largest employer was the military.

Mullery is a private man. He does his job quietly, in the background of a school of roaring halls and full classrooms and jostling crowds at the bases of stairways. Many members of his team, particularly those who work night shifts, share this trait of being, in his words, like a hermit crab, most comfortable in a shell. For Mullery, that characteristic traces its roots far back in his story.

"My life experience made me a quiet person," Mullery said. "I've been wronged by a lot of people, both of my fault and not of my fault. Even doing this interview is progress for me."

That introversion fits no job better than leading the custodial team; his work allows Mullery to stay largely behind the scenes while still doing good. But even as a teenager, attending a high school where bullying and teasing were far more common than at Redwood, he felt most comfortable in solitude. Fairfield High had some 3,000 students when Mullery attended, and an average class size was 45 kids. During his sophomore and senior years, he spent much of his time playing basketball (and still practices twice a week). But when he was a sophomore his parents split up. He began to do the bare minimum to graduate and disconnected from his peers.

"Growing up I became kind of a loner. That's why I say I'd do high school over again if I could, because I'd just decided I didn't like people. I'd just go home and play video games and that was my life," Mullery said.

Disconnecting had its costs. By the time senior year came around, his grades had suffered. He faced a decision between playing basketball and graduating. In fact, he went into senior year with the credits of a sophomore.

At 17, it was his step father who pushed him to re-engage, to do chores around the house instead of gaming, to focus and fix the work ethics he'd developed over the years. He began to dedicate huge amounts of time to his studies.

"It was pretty much school from six in the morning till 10 in the evening," Mullery said.

In the end, his renewed concentration prevailed. He graduated three months early from high school while working a full time job at Target. However, he soon had another choice to make. Unlike Marin, Fairfield boasted few obvious opportunities after high school. While Mullery wasn't sure what he wanted to do as a career, he knew he wanted to do it far from Fairfield. If he got stuck there, he said, his life would never turn out the way he envisioned it. There were only two futures for kids in Fairfield: construction or jail.

> **The best way I could phrase it is that at 24 years old I accidentally fell into a career.**
>
> **Tim Mullery,** *Head Custodian*

At 22, he chose construction. He moved to Petaluma and started working for a company that he imagined would be his future, under a mentor who taught him to always pay attention to the details and seek perfection. At the same time, he met and began dating his future wife. But not long into his would-be construction career, the company he worked for closed. Mullery ended up working at Old Town Glass in Novato for seven months, hoping all the while to join his good friend in starting his own glass company. Meanwhile, he took a position as a substitute custodian at Drake High School. Initially, he planned to work there only for six months. But his long-term plans had shifted, and he began to think about starting a family, and looking at the job's retirement and medical plans, he saw a future take shape.

"The best way I could phrase it is that at 24 years old I accidentally fell into a career," Mullery said.

After being hired at Redwood, he rose to a leadership position quickly, replacing the previous lead custodian five years earlier than he had anticipated, when his predecessor became sick and retired.

While the promotion was cause for celebration, during that same year his daughter was born and he was in the process of losing his house; over the course of his 34 years, Mullery has lived in 22 houses.

Since the uncertainty of those initial years, Mullery has been a custodian in the district for a decade, learning most of his skills on the job and from observing maintenance personnel at work.

Of course, there's more to the title of lead custodian than hands-on work. As the team's leader, it's his responsibility to prioritize jobs, set up daily schedules, answer email requests, coordinate with the administration, put in work orders for aid from external companies, set up and clean up for events like rallies and even deliver mail around the school. Mullery is also the vice-president of the Tamalpais Union High School District's chapter of the California School Employees Association. In both of these pursuits, he has become a trusted voice and a capable leader, though when he was younger he never expected to be in such a position.

In this way, he represents an incredible success story. He spoke of friends in and out of jail and recovering from serious drug problems, but in his own life, Mullery has outpaced the obstacles of his initial circumstances and built a family as well as a career.

> **When I got here I was a kid with a girlfriend, now I'm a man with a wife and a mortgage. I grew up at Redwood.**
>
> **Tim Mullery,** *Head Custodian*

"When I got here I was a kid with a girlfriend," Mullery said, "Now I'm a man with a wife and a mortgage. I grew up at Redwood."

Today Mullery looks to the future, to the possibilities he sees in his children. He works to raise his two children correctly, to teach them proper values by being at their side.

"My parents weren't at much of my stuff. I want to be at those events. First day of kindergarten, first day of soccer practice, be at the games, give them every opportunity to succeed," Mullery said.

Reflecting on his own upbringing, he said, "Growing up was weird. As a kid I felt like I had it not so good, and looking back I realize I had it not so bad. I didn't have all the toys and gizmos but my dad worked non-stop and we usually had food to eat."

In his personal world, he works to open up to people around him. He strives to take down the barriers his own upbringing built, to move towards greater confidence and sureness. He also plans to go back to school and study the subjects he loved in high school, like computer programming. He sees himself in some years taking an IT position in the district.

Most of all, he hopes to never stop having fun in his work.

"If I come in here and I'm not enjoying it, I won't be here. Life is hard. Work is just work. I get to come here and make a difference, and it's almost a break from reality. I get to just be productive and live," Mullery said.

Redwood holds a unique charm for Mullery. The ailments he saw in his high school days have become the strengths here. The students who would have been picked on in his high school are celebrated: the weird kids have become the cool kids. School spirit stands taller in the community here, especially at rallies.

"I really enjoy it. I may not come off that way but I love my job and everyone here," Mullery said. "I'll stand back at rallies and just watch and think to myself, even though I have to clean up afterwards, 'Wow, I get paid to do this?'"

However, Mullery sees the lack of hardship in Marin causing an unrealistic perception of the world in many students. Students often express a limited understanding of their good fortune and opportunities.

"Life doesn't always work like it does in this area," Mullery said, "Sometimes the appreciation is gone. You lose track of it when you break something and you're just given another."

What's more, students here rarely have to earn their possessions, which alters their view of how valuable things are.

"I can't compare [Marin] to where I grew up because it's different. People who don't work for things and just get them don't respect [the things] as much. But you can't blame a kid for where they happen to be born," Mullery said.

In the end, the place he was born is part of what shapes Mullery's own personality to this day. He demonstrates humility and gratitude, sometimes for the smallest luxuries he never had.

"There were times when I opened up my fridge and I was lucky if there was food, but there are times I open up the fridge now and I laugh because I'm lucky," Mullery said.

In his work and personal life, Mullery displays a consistent dedication to jobs well done, and in both the hurdles he has leapt and his daily endeavours, he exemplifies the best aspects of perseverance.

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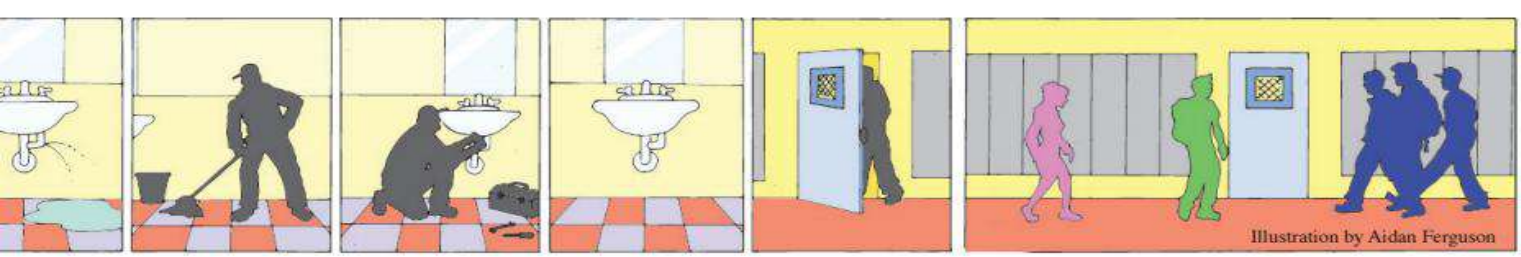

Illustration by Aidan Ferguson

VIDEO PRODUCTION

“3 Principles for Starting Over” — a video project documenting my move to New York (click here to watch on YouTube)

“Project Rewind” — a video essay about the fallibility of memory and the process of digitizing over 100 hours of 8mm home video: how and why to do it (click here to watch on YouTube)

“A Gift for a Friend” — a video about building an Altoids-tin-sized circuit board with push buttons and an LCD as a gift (click here to watch on YouTube)

My siblings and I gather for a coerced after-lunch photo shoot. From left to right: Aya, Julien, me, Jinsuke, Camille.

Maxime Kawawa-Beaudan is an nineteen-year-old Bay Area native and a freshman at the University of California, Berkeley, pursuing a B.A. in Computer Science with a minor in Creative Writing. He is a 2017 National Young Arts Foundation finalist in writing. This will be his first major print publication. Find him at www.mkbstories.com.

WAITING FOR FIREWORKS

Maxime Kawawa-Beaudan

Will salted the rims of our plastic cups in the shadows around the firelight. He dropped ice cubes into each cup, followed by a shot of vodka, and a shot of the "special sauce," which was some mixture of agave nectar and honey.

We gathered around the fire pit in my backyard. The nine of us huddled under scratchy acrylic blankets and put our feet up to warm. The wind swept through in hard gusts that flattened the flames, turned them into blades, let them roar up again. It was a game of chicken. The wind swelled from the north and then the east and blew the flames to lick feet in the opposite direction and we pulled our toes back in the nick of time, hooting at close calls. I looked around at the ring of laughing faces, pale orange in the light of fire. Sixteen eyes glimmered like crystal, reflected what moved before them.

A few hundred feet away my parents slept. Every few minutes when Will or Andrew raised their voices in the heat of some debate I shushed them and we all cast furtive glances back into the windows of the darkened house. I grinned at the stupidity of it. I didn't know what my dad would do if he saw us mixing drinks in his backyard. I didn't want to know.

Glimmer Train Stories, Issue 103, Fall 2018

Will passed us our cups.

"Today, for you ladies and gentlemen, I've prepared margaritas," he said.

Dylan rolled his eyes. "You don't have to build this up into some kind of event, just give us our drinks."

"You don't want a drink?" Will asked.

"No, I want a drink, dumbass, I just don't want to listen to your monologue."

"No drink for you." He went on with Dylan bitching in the background.

I sat with my arm around Daniel's bony shoulders. He was the only one of us without a drink. He never drank, on principle, not that he was opposed to it.

"You all right?" I asked, though I knew he would be.

"It doesn't bother me," he said.

Daniel settled his head back against my arm. I could feel him thinking. He was, to me, always clear. There was the brotherhood of long friendship between us, a channel that was open without any need for preamble. Some nights he would text me or I would text him after weeks of not speaking. Our friendship was like that; it never demanded maintenance or reassurance. Two summers earlier we'd practically lived with each other. We'd played ping pong and eaten each other's cereal and wandered through town and fallen asleep in the same bed and woken up and repeated. We weren't that close anymore. We didn't have the time. But the river of thought that summer opened between us had never closed.

The night passed. Dylan and Will argued. Glennis and Andrew cuddled. I took a shot with Will. The burning liquid passed down my throat and settled in my stomach and spread through me from the inside out. I felt feral, small, drunk and whirling in the flying night, anchored by Daniel at my arm. Scott and Jeremy across the circle joked with each other.

Matt pulled a sunglasses case from his backpack. He pulled out a plastic bag with a perfectly rolled joint in it and a lighter.

"You didn't," Will said, grinning.

"I did." Matt took the joint out and lit it. I stood and walked over the fire to where he was. I cupped my hands around the joint to

prevent the light from going out. "Thanks," Matt said. The paper burned.

"I'm not trying to get crossed tonight," Dylan said. We respected that.

Glennis, who had never been drunk before tonight, looked worried too. I frowned at her. "I can't," she said, "Drinking is fine, but I promised myself I'd never smoke." We respected that too. Standing over the burning joint, I thought about Daniel and how strict he was with his principles. I thought about how our principles were all we had. We were all setting out on the unknown plain with our principles as torchlights, hoping they would lead us somewhere good.

"Give me some," I said.

"Go easy," Matt said. "If you don't smoke that often I wouldn't recommend hitting this stuff too hard."

Steuart chuckled. Matt and Steuart were the two members of our group who knew the most about drinking and smoking. They had secret other lives with other friends, people we only referred to as "shady types."

I took a hit, and then another. I felt nothing. I went back to Daniel.

At some point Steuart stood up and left the protective circle of the fire. He went to the edge of the yard and looked up into the great black dome of night. We let him be. He did this whenever we hung out. I looked too. Here we were, eighteen, and eighteen for this small moment, and one day to be fifty, one day to be sleeping a hundred meters from our children, who would giggle in the night and drink our liquor and hope we didn't know.

I remembered learning about the search for exoplanets. When scientists looked for planets circling distant suns, they measured the brightness of the stars. When a planet crossed between the star and the telescope, the light would dim just a bit, and that's how scientists knew there was something there. I wondered if there were scientists on other worlds looking back at us. I wondered if the Earth dimmed Sol by half, or a quarter, or if it was nothing but a blip. I wondered if our fire or the city across the bay, our tiny lights blazing against the pressing darkness, made any difference.

I hoped it did. I thought out to the alien scientists, "Here we are!

Eighteen and long buried and dead when you see our firelight. Don't forget about us!"

Daniel tethered me to the couch with his weight and I thought it was only his human ballast that kept me from drifting up like a weather balloon. If he left me, I would tumble nightward and be lost.

At eleven we stood. I turned off the gas. The fire shrank from orange to blue and the last blue fingers sank back between the coals in the pit. We folded the blankets and took the handle of vodka and went to climb the hill.

A grand feeling diffused into me from the nearly midnight fog. I skipped along and reversed back, always walking alongside Daniel. Like a caravan through a darkened desert, we trailed up the street. At the end of the street we climbed over the fence to the undeveloped open space, a plain of long golden grasses and hardened deer droppings.

"Woop! Woop!" I shouted at one point. The call rebounded from the quiet houses. A dog barked in response. Jeremy turned and grinned at me.

"You're so gone right now."

"No, I'm all right. I'm just happy," I said.

Jeremy dropped back to walk alongside Daniel and me. A chill settled between us. It was the knowledge of the coming split. Jeremy was off to Yale. Daniel would be going to UCLA. I was going to Berkeley, while Matt would be at the University of Washington. For twelve years our tracks had run parallel, some joining later than others. Now they had to run off into far distant corners.

"Ah, shit," I said.

"Yeah," Jeremy said. "But we'll see each other when we come back for summers. And we'll all keep in touch."

Ahead of us the caravan snaked along the beaten path toward the rock on the outcropping above my house.

"Have you ever been to summer camp?" Daniel asked.

"I know what you mean," I said.

"You always say you're going to stay in touch with those people, and for however many weeks you spend with them you really are good

friends, but when you get home it's so easy to forget. A few weeks go by and you don't even remember their last names."

"But this is different," Jeremy said. "We've known each other for so long. I'm sure if we make an effort."

"Sure," Daniel said.

In silence, we made our way to the rock. It was a lone granite block with a panoramic view of the bay. The stars glittered down at us from an enormous sky. San Francisco and the bridge and Berkeley cowered at the horizon. We sat with our drinks and our asses on the bare sharp rocks.

The wind blew fast against our faces and I looked up and saw eternity and the coming day and the night after that and the day and night and a hundred years gone by with the stars still just how they were that night. And I wondered how long it would take until we stopped talking. And how long until we heard a name and remembered each other and realized that sometime we'd forgotten without realizing we were forgetting. How long before eighteen became a dream that'd slipped away in a long-gone morning, only to come back in pieces years later?

I knew what I would remember. One day in junior year we'd all gone to the beach together. Will had driven some of us, and I was in his car. We were coming up on the beach when we hit a sharp turn, and Will jerked the steering wheel about hard. The three of us stuffed in the back—Daniel, Jeremy, and me—fell against each other. Dylan in the front seat worked hard to seem nonchalant.

"Don't kill us," he said.

Will spun the wheel all the way about in the other direction. "I've got it."

"I don't trust you at all," Dylan said, hanging onto the handle above, "I think you'd kill us just to hear the tires screech."

We came around the bend in the road. The wide flat plain of the Pacific stretched out beyond that strip of tan beach and the red-tile roofs of Stinson. Jeremy gripped his flute case as if it were a baby that might hit its head against the door and die. Scott added a few songs to the playlist he was building.

I looked west to the pregnant sun hanging low in the sky and thought that I'd never be this content again. When the car straightened out Jeremy hummed and practiced some piece on an imaginary flute: *dicca-dum-dum-dicca-dum*… We were young and warm with the windows open in a car speeding down to certain death or summer days and I closed my eyes and let the wind tousle my hair and hoped we'd get to Stinson in one piece.

At midnight, the sky exploded into color. Fireworks over San Francisco, over Sausalito, over Berkeley. I was sober again. Will was not. Dylan was buzzed. The fireworks thundered on. Our mouths fell open with fatigue and sadness and joy.

"Isn't that amazing?" Jeremy said.

"It's beautiful." Daniel was half asleep.

The beauty came over me. I saw myself from above, a little dark form surrounded by other dark forms, a group of dots on a hilltop without even a light to separate it from the brush all around. My people, gathered around a rock. I had the urge to jump up and scream and laugh. But I didn't. Instead I leaned against my friends, who were behind me and in front of me and to the sides and everywhere in the world. I leaned on the threads of all the good times we'd had, threads ready to stretch like elastic over thousands of miles and distant shores. I leaned on them just to feel their strength. I tethered myself to these people I'd grown up with and in their eyes, so turned to the future and Great Big Things to come, saw the light and color of our childhoods shine against the night.

I wrote three versions of "Waiting for Fireworks." I was obsessed with this moment of transition and uncertainty. Of no longer being a unit of family or a friend group but just an individual. Of having autonomy, of no longer being told what to do, of being fully responsible for my failures and successes.

I went to school with the same people for twelve years. Whether I was good friends or only acquaintances with someone, I had played kickball and banana tag with them on the Reed School field. I had watched them learn to read, encounter a letter in math for the first time, and celebrate the one hundredth day of school with Froot Loop necklaces. I was with them as we became nasty middle schoolers, then angsty high schoolers. As we began to self-determine and form groups. It was only at the end that we realized what we had, and how wonderful it was to know and be known by everyone.

I graduated high school alongside the people with whom I'd played Legos. "Waiting for Fireworks" is about these friendships—the friendships that require no maintenance—and the love I'll always have for the people I grew up with.

—Maxime Kawawa-Beaudan

GRADUATION

REDWOOD
BARK
V. LIX N. 8
May 26, 2017 • Larkspur, CA

Illustration by Maxime Kawawa-Beaudan

redwood bark.

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TRUMP.

Cover design by Maxime Kawawa-Beaudan and Gregory Block

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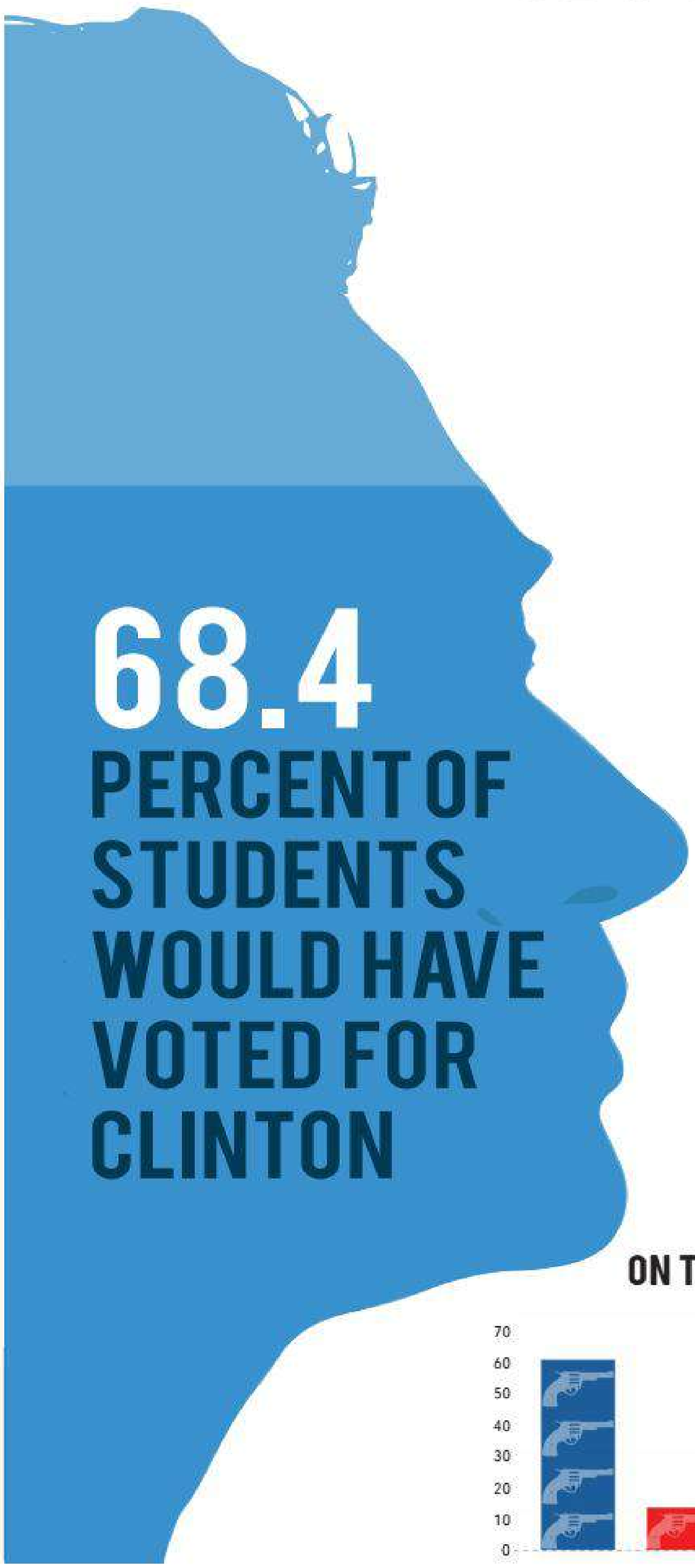
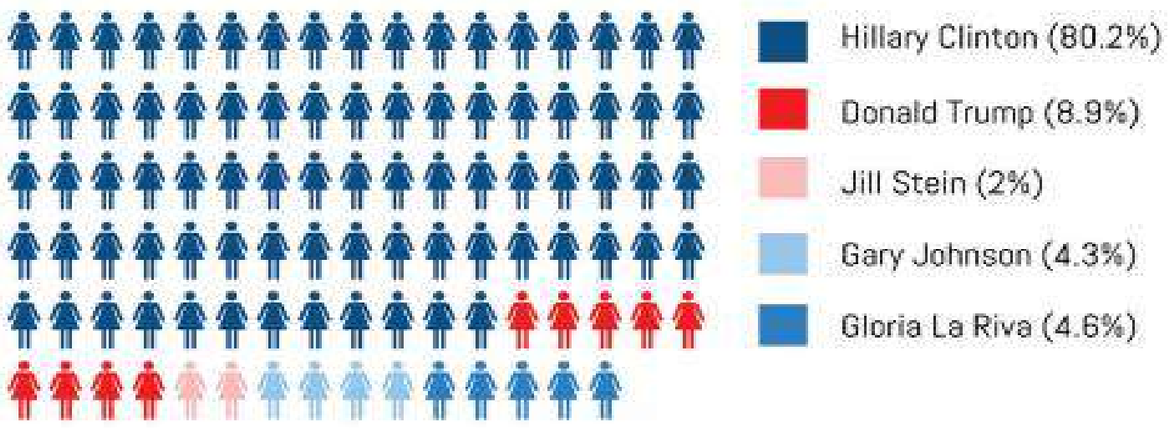


The day before millions of Americans headed to the voting booths, Redwood students filled out their own makeshift ballots. On Nov. 7, the *Bark* ran its election survey in conjunction with Tam's student-run magazine, *The Tam News*. The 10-question survey was not mandatory, but students were encouraged to take it during Monday's advisory period. Survey questions were centered around the presidential election and controversial election issues, including gun control, the legalization of marijuana, and fairness of the police force.

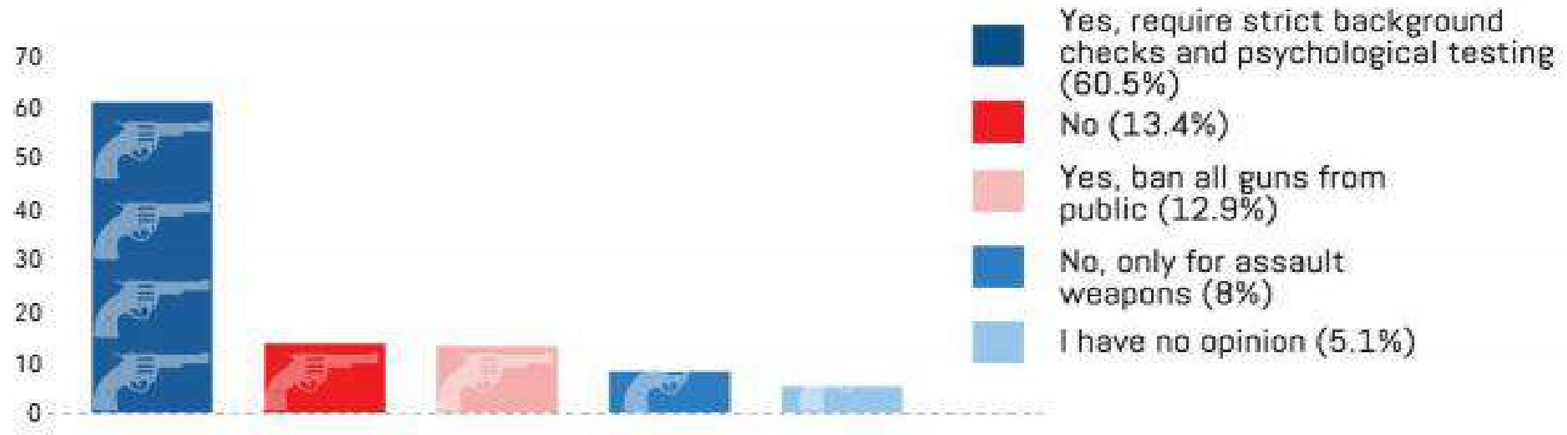
The survey results cemented the fact that Redwood students are very liberal, mirroring the political views of Marin County and Northern California as a whole. Redwood students not only demonstrated support for Hillary Clinton, the Democratic presidential nominee, but also aligned with the Democratic Party's views on key issues. For example, 52.8

FEMALE STUDENTS



WHAT DO YOU THINK OF THE RELATIONSHIP BETWEEN THE POLICE FORCE AND THEIR COMMUNITIES?

SHOULD THERE BE MORE RESTRICTIONS ON THE CURRENT PROCESS OF PURCHASING A GUN?



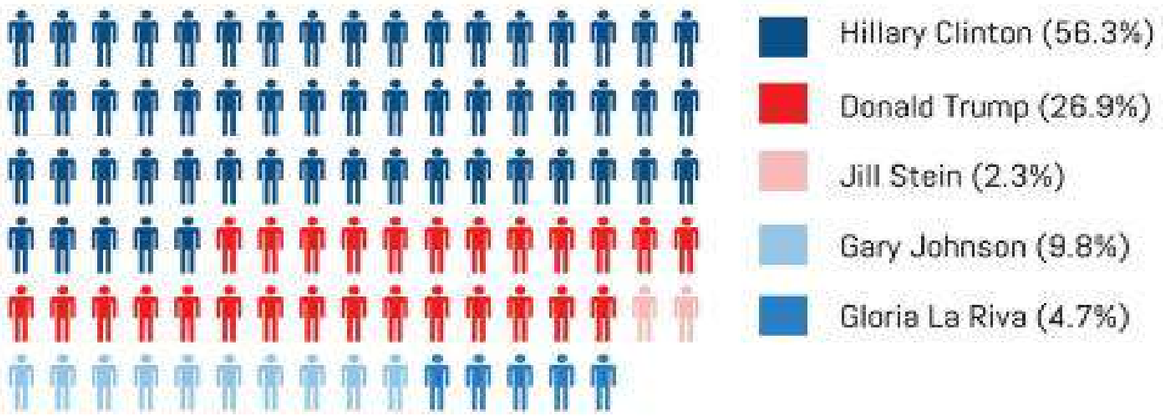
LECTION OULD HAVE VOTED

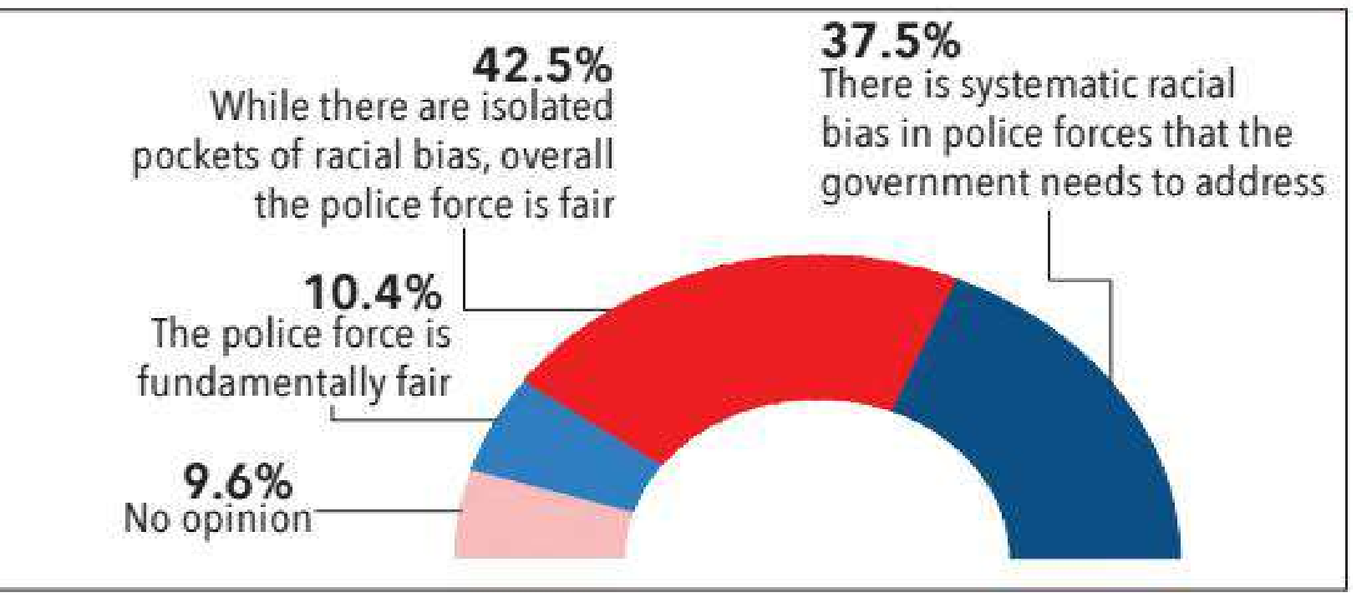
percent agreed that all marijuana use should be legalized, both medically and recreationally. Also, 60.5 percent of students said there should be strict background checks and psychological testing before someone could purchase a gun.

However, a shift toward the center was apparent once the voting results were narrowed down to students who were actually able to vote in the 2016 election. Out of the 798 Redwood students who took the survey, only 55 were old enough to vote in the election. Out of those students, there was an equal split between Clinton and president-elect Donald Trump. Also, among students who were able to vote, over 70 percent believed the police force was mainly fair, compared to 52.9 percent of all students.

The Tam data was almost identical to Redwood data as 67.9 percent of Tam students also said they would vote for Clinton.

MALE STUDENTS





17.8 PERCENT OF STUDENTS WOULD HAVE VOTED FOR TRUMP

DO YOU SUPPORT THE LEGALIZATION OF MARIJUANA?

Gregory Block, Annie Fogarty, Maxime Kawawa-Beaudan, Anne Pritikin, Sydney Soofer and Pearl Zhong contributed to this story

CLINTON.

Chapter 1

Background

1.1 What's So Great About Legs?

Legged robots are powerful for the same reasons that many animals have evolved systems of legged locomotion. Legged systems, whether biological or robotic, are versatile and agile. They can navigate rough terrain, surmount imposing barriers, and traverse obstacle courses far more easily than can their tracked and wheeled robotic counterparts.

The unconscious nature of biological motor control gives the illusion that legged locomotion is a simple task. In fact, the dynamics of legged movement are complex. Legged systems in motion are unstable. A body's joints have limitations with respect to achievable angles, safely applicable torques, and maximum velocities. The joints connect masses each with their own inertial properties and stability conditions. These constraints must be respected to avoid collapse. Even in the simplest environments, walking involves evaluating potential footholds for load-bearing fitness, balancing body mass against gravity and ground contact forces, and planning sequences of joint movements to reach safe foot configurations.

Many methods in traditional robotics decompose legged movement explicitly into these or equivalent substeps. For example, [11] uses an optical terrain scanner to map the robot's surroundings, segments this map into a grid, estimates the fitness of each grid square, and identifies potential footholds. A complex series of hand-coded rules govern this process, as well as the process of moving each foot to its target position.

1.2 Learning From Action

As the field of artificial intelligence matured, neural-network-based systems proved their worth for a broad class of traditional problems. Robotics is no exception. As universal function approximators, neural networks can be trained to replace many previously hand-coded robotic systems – for instance, they can learn the dynamics of a robot's actuators without any engineered guidance [7].

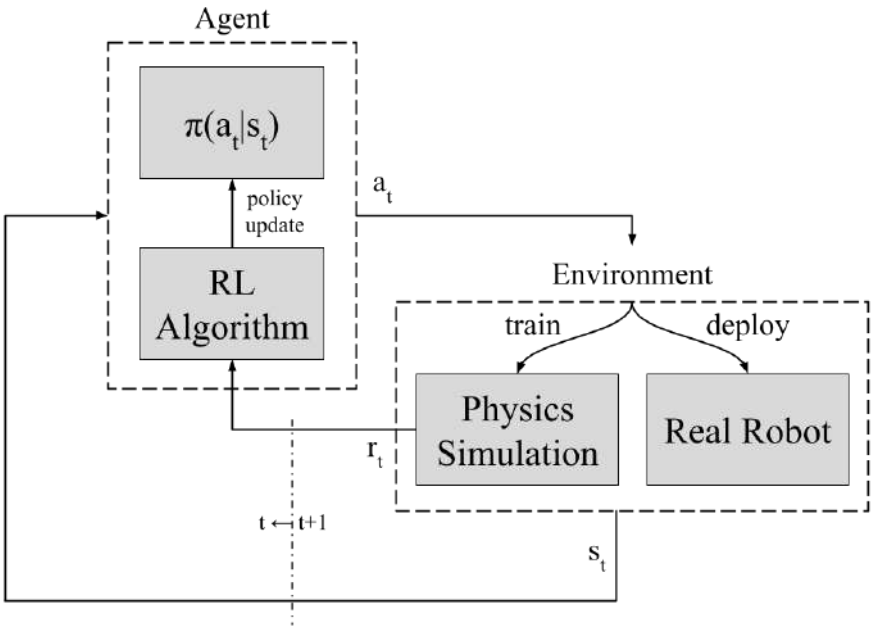


Figure 1.1: Block diagram of the reinforcement learning paradigm. a_t, s_t, r_t are, respectively, the actions, states, and rewards at timestep t.

There is a catch: training neural networks takes generally on the order of hundreds of thousands or millions of steps. At each step the parameters of the neural network are adjusted slightly to improve the network's performance. For problems in robotics, this may mean having a robot attempt to walk thousands of times – a training regimen which could take days, weeks, or months to complete and would likely damage the hardware beyond repair.

A faster alternative is to build an accurate simulation in which physically realistic models of robots learn policies for motion which are then transferred to robots in the real world [13]. These simulations, training multiple robots in parallel at faster than real time, allow simulated robots to acquire hours or days worth of simulated experience in minutes of wall-clock time.

There is another catch: many neural-network-based tasks have clearly defined target outputs for a given input. For example, a neural network is given a collection of images and asked to determine for each image whether it contains a cat. The target output, or ground truth, is "Yes" if the image contains a cat and "No" otherwise.

Many robotics applications, however, involve sequential decision-making tasks. At any given timestep, there is no ground truth – no pre-determined right answer, no known sequence of motor positions that result in the best outcome. Take the example task of a robot opening a door. There are many ways for a robot to turn a door knob, none of them any more "correct" than another at any single slice of time, and success – whether the door is open or

closed – is determined only after many consecutive movements.

A reasonable sequence of actions is also not universally appropriate. A robot cannot learn one series of actions to turn all door knobs from all intial positions, like a video game character acting out a pre-programmed animation. When a robot takes an action, the environment changes in response. The door may move when touched; the knob may slip out of the robot's grasp when turned too quickly. This is key to the difficulty of sequential decision making. A cat classifier neural network does not have to contend with the fact that saying "Yes" to one image may change the contents of the next image.

For these reasons and more, problems in robotics are increasingly approached as tasks in reinforcement learning, a subfield of artificial intelligence studying methods for learning from action. As seen in Figure 1.1, in reinforcement learning, decision-making algorithms called agents take actions a_t at each timestep t. They use a decision-making rule called a policy, denoted by π, to decide which actions a_t to take given observations of their environments represented by the state s_t at time t. These actions a_t in turn affect their environments, and from the environment they receive a reward r_t which indicates the fitness of their chosen action. At this point one timestep or "transition" is complete and $t \leftarrow t + 1$.

The agents' incentive is not to match some ground truth at each timestep but to maximize a cumulative reward over sequences of timesteps.

Formally, the environment makes up a Markov Decision Process, consisting of a state space $\mathcal{S}$, action space $\mathcal{A}$, transition operator $\mathcal{T}$, and reward function r where:

$$\mathcal{T}_{i,j,k} = p(s_{t+1} = i | s_t = j, a_t = k) \; \forall s_{t+1} \in \mathcal{S}, s_t \in \mathcal{S}, a_t \in \mathcal{A} \tag{1.1}$$

$$r : \mathcal{S} \times \mathcal{A} \to \mathbb{R} \tag{1.2}$$

The objective is to find a policy $\pi_\theta(a_t|s_t)$, parameterized by θ, which outputs $p(a_t|s_t)$ and maximizes the cumulative reward:

$$J(\theta) = \mathbb{E}_\pi \left[\sum_t r_t \right] \tag{1.3}$$

1.3 Motivation

The E-ROBOT Prize, put on by the U.S. Department of Energy, aims to source innovative solutions from academia to dangerous or arduous building industry tasks. These problems broadly include sensing, inspection, mapping, and retrofitting tasks. U.C. Berkeley's Video and Image Processing Lab's hexapod robot for exploring tight and inaccessible spaces placed as a finalist in the first phase of the competition. The goal of this project is to design a robot which can autonomously navigate such confined spaces. By partially automating the inspection process and eliminating arduous parts of the job such as the one depicted in Figure 1.2, the project proposes a way of making retrofitting safer for workers. The overarching goal of automating inspection and retrofitting is to make buildings more energy efficient.