



# WELCOME TO The WeRISE SUMMIT 2024



Welcome to the WeRISE Summit!

The WeRISE (Working to Eradicate Racism In Science and Engineering) Summit aims to bring together a community of people concerned with racial justice as well as economic, gender, disability, health, environmental, climate, and other social justices. As equity, community engagement, and justice are emerging research concerns in engineering, this conference hopes to bring together students, teachers, scholars, practitioners of engineering and engineering education as well as the wider community and community partners. The summit is dedicated to showcasing the most recent research and curricula at the nexus of engineering, social justice, and community engagement. **The WeRISE Summit will be held on May 24, 2024 at the University of California, Berkeley in a hybrid format.**

## LOCATION

Sutardja Dai Hall  
University of California,  
Berkeley, Berkeley, CA  
2594 Hearst Ave, Berkeley,  
CA, 94720, USA

## DATE & TIME

May 24, 2024  
8:00 AM - 7:45 PM

## INTERNET

WIFI Name: Berkeley-  
Visitor

Access Summit  
site by scanning  
this QR Code



Hearst Ave

136

Blum Hall



Sutardja Dai H



**Banatao Auditorium  
Summit is HERE!**

2594



Yali's Qualcomm Café

# SCHEDULE AT A GLANCE

<b>TIME</b>	<b>SESSION</b>	<b>LOCATION</b> B- Banatao Auditorium K- Kvamme Atrium
<b>8:00 AM - 9:15 AM</b>	Registration and Breakfast	K
<b>9:15 AM - 9:30 AM</b>	Opening Remarks	B
<b>9:30 AM - 11:00 AM</b>	Documenting Environmental Injustice	B
<b>11:00 AM - 11:10 AM</b>	Break	K
<b>11:10 AM - 12:15 PM</b>	Decolonizing Methods and Liberatory Pedagogies	B
<b>12:15 PM - 1:15 PM</b>	Lunch	K
	Lunch and Learn: Non-hierarchical and Relational Organizing Efforts and Their Impacts on Ending University Partnerships with War Profiteers	B
<b>1:15 PM - 1:50 PM</b>	Accessibility, Universal Design, and Human-Centered Design	B
<b>1:50 PM - 2:00 PM</b>	Break	K
<b>2:00 PM - 3:15 PM</b>	Beyond DEI: Intersectionality, Interdisciplinarity, and STEM	B
<b>3:15 PM - 3:25 PM</b>	Break	K
<b>3:25 PM - 4:45 PM</b>	Infrastructural Justice and Community Engaged Scholarship	B
<b>4:45PM - 4:55 PM</b>	Break	K
<b>4:55 PM - 6:05 PM</b>	Environmental and Climate Justice	B
<b>6:05 PM - 6:15 PM</b>	Closing Remarks	K
<b>6:15 PM - 7:45 PM</b>	Poster Session and Mixer	K

A low-angle, upward-looking photograph of several modern skyscrapers with glass facades. The buildings are set against a clear, light blue sky. The perspective creates a sense of height and architectural grandeur. The text is overlaid on the central part of the image.

# ⊕ OPENING REMARKS

J'Anna Lue, Michelle Henderson,  
Maya Carrasquillo, Joan Walker



# PRESENTERS AND PRESENTATION SCHEDULE



DOCUMENTING  
ENVIRONMENTAL INJUSTICE

9:35 AM – 10:50 AM

# DOCUMENTING ENVIRONMENTAL INJUSTICE



## BILAL MOTLEY

*Independent Filmmaker*

### Confronting Environmental Injustice Through Film

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**BIO:** Bilal Motley, a filmmaker and actor from Greater Philadelphia, earned acclaim for his documentary "Midnight Oil," an official selection at the BlackStar Film Festival and a Doc Society NYC grantee, now distributed by Black Public Media. The film explores his internal conflict between the camaraderie he feels with his refinery colleagues and his increasing awareness of the environmental justice struggles faced by surrounding communities of color. His animated short "Quarantine Kids," depicting his daughter's pandemic experience, won accolades at the BlackStar Film Festival and the March on Washington Film Festival. His latest project, "Trash & Burn," documents the 30-year battle of his hometown, Chester, Pennsylvania, against America's largest trash incinerator.

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**ABSTRACT:** My work focuses on creating documentaries that explore and highlight environmental justice issues, primarily seen through the lens of small, often marginalized communities. These films aim to bring attention to the often unseen or overlooked struggles of these communities, grappling with the significant consequences of industrial environmental impacts.

"Trash & Burn" (2024) tells the story of Chester, Pennsylvania's 30-year battle against the United States' largest trash incinerator. This facility has caused profound distress to Chester's predominantly black community, showcasing a glaring example of environmental racism in my hometown. The documentary captures the community's resilience and continuous fight against systemic injustice. It's not just about the struggle against the incinerator, but also about the community's spirit and determination to seek justice.

Meanwhile, "Midnight Oil" (2020) offers a personal perspective on environmental justice, as it draws from my fifteen-year experience as a steelworker at a major oil refinery. This award winning film delves into my internal conflict – the camaraderie and loyalty I feel towards my fellow workers and the growing realization of the environmental and health impacts our work has on neighboring communities, especially those of color. The documentary captures the complex emotions and challenging decisions faced by individuals in the industry, as they come to terms with the broader consequences of their work on their community and environment.

Together, these films aim to shed light on the intersection of industry, community, and the environment, exploring the challenges faced by those living in the shadow of large industrial operations. They highlight the importance of environmental justice and the ongoing fight of communities to protect their health, homes, and futures.





# JASPER WILSON

*Undergraduate Student, Journalism,  
Washington State University*

## Forest on Fire: A Documentary about the Changing Relationship of Fire in the Sequoia Ecosystems

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**BIO:** Jasper Willson is a documentarian who just graduated from the Edward R. Murrow College of communication. A child of a journalist and an activist, her work meets at the cross section of advocacy and news. Her recent film, "Forest on Fire" is a 10-minute documentary that explores the relationship of fire in the Sequoia ecosystems through history.

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**ABSTRACT:** Creative Endeavor:

Video is an effective way to communicate scientific knowledge to non-experts. Interviews combined with diagrams and video can transform dense topics into digestible content.

My research project examines how fire affects the two Sequoia ecosystems. These environments have very different relationships with fire, and each has changed significantly since pre-colonization. I explore this change and introduce the viewer to modern efforts designed to restore the forests to a healthy life cycle in balance with nature.

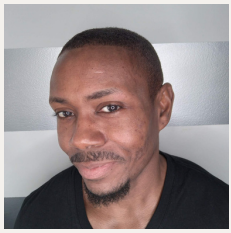
Methods:

There are three stages in documentary creation: pre-production, production, and post-production. During pre-production I read technical papers and held informational interviews to identify a single, clear story to tell. After drawing out a storyboard, I identified legal locations to shoot footage and experts to interview on-camera, then production began. Using a mirrorless Nikon Z50 and a steadying gimbal, I filmed forests and experts across week-long trips to each Sequoia ecosystem in California. Post-production included mixing several audio tracks to create a cohesive auditory experience and cutting hours of raw footage into a concise, clear ten minute video. I used Adobe Premiere Pro and After Effects, which are considered industry standard software.

To learn how to effectively communicate scientific topics, I watched documentaries to study styles. I was inspired to interview scientists and nonscientists for the video in order to bring the viewer multiple ways to identify with the subject. During post-production, I screened my documentary to evaluate the efficiency of my creative choices and to see what people were learning

Cultural Impact:

So much important work is being done in the scientific community. Climate change continues to destroy our world. This makes understanding these complex environmental systems critical. Education can help people make thoughtful decisions. Video is one of the best ways to do this on a large scale.



B. Preston Lyles



Lynn Robinson



Sonny

## B. PRESTON LYLES, LYNN ROBINSON, SONNY

*Organizers in Toxic Prisons Campaign of the Human Rights Coalition*

## I Can't Breathe: The Toxic Prisons Campaign Fight for Environmental Justice

**BIO:** B. Preston Lyles, Sr. a native of Philadelphia, Pa has experienced a lot of good in his life as well as some share of less desirable times. BP holds 3 degrees; a Bachelor of Religious Education, A Practical Doctorate, the Masters of Divinity and a Master of Science in Higher Education Administration, Org. Leadership with a secondary concentration in International Peace and Diplomacy. He has spent over 30 years engaged in public speaking, working with and leading teams of various sizes, serving as a life coach to many, mentoring adults, raising up leaders and maintaining strong and meaningful long-term relationships with friends and family. BP is currently a Lead Organizer with the Toxic Prisons Campaign of the Human Rights Coalition. He has a personal understanding of deep pain, loss and imprisonment. BP has made a personal commitment to being involved in the active change dialogue of Restorative Justice, seeking to impact the positive progression of reducing recidivism, unjustified incarceration and the closure of all environmentally toxic prisons.

**BIO:** Retired Philadelphia Public School teacher, founder/director of a local environmental justice Taskforce called Neighbors Against the Gas Plants since 2017, human rights activist currently a member of Jewish and Interfaith groups advocating for the US to demand and enforce a permanent Cease Fire in Gaza, and fully fund UNWRA, the UN humanitarian distribution agency in Gaza.

**BIO:** Sonny is an activist and farmer based out of Philadelphia who has been working with the Human Rights Coalition as an organizer. They recently moved to the bay area and are looking to get more involved in local prison abolition movements.

**ABSTRACT:** 'I Can't Breathe: The Toxic Prisons Campaign fight for Environmental Justice' is a compelling 43 minute documentary shedding light on the often-overlooked issue of institutional pollution. Delving into Prisons and the criminal Justice system, this film uncovers the Environmental perils lurking within these facilities. From hazardous waste, mismanagement of healthcare, relational toxicity through to the impact on local ecosystems, 'I Can't Breathe' explores how systemically unjust institutional practices contributes to the world's pollution. Utilizing Natural Research including experts and members of the affected communities, the Toxic Prisons Campaign with this documentary calls for urgent public awareness and systemic changes to mitigate the far reaching consequences of institutional pollution.



Maya Trotz



Dominique Cobb

# MAYA TROTZ

*Professor, Civil and Environmental Engineering,  
University of South Florida*

Dominique Cobb, Cynthia Ellis Topsey, Walter Smith, Lena Young Green, Michelle Henderson,  
Heather Hopkins, Desa Philadelphia, Rebecca Zarger, & Christine Prouty

## Telling Stories and Confronting Environmental Injustice Through Film

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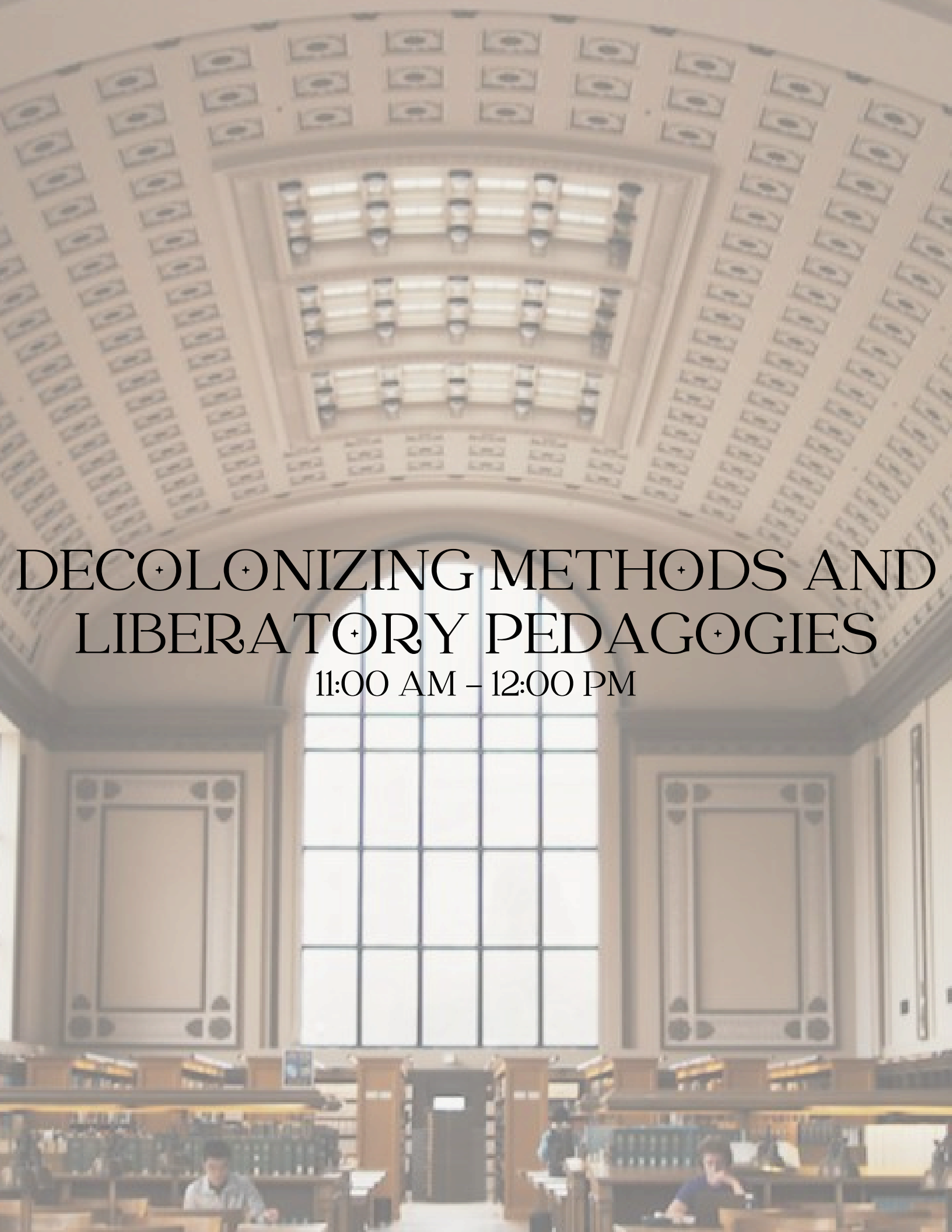
**BIO:** Dr. Maya Trotz (she/her/hers) is a professor of Civil and Environmental Engineering at the University of South Florida. She has led projects to increase research experiences for undergraduate students and teachers, and currently leads an interdisciplinary team to improve undergraduate STEM education by addressing issues of equity and inclusivity in civil and environmental engineering curriculum. She is also working with academic and professional organization colleagues on a grant to identify, understand, and minimize the loss of women faculty, Strategic Partnership for Alignment of Community Engagement in STEM (SPACES). She is a past President of the Association of Environmental Engineering & Science Professors and a board member of Fragments of Hope Corp, a non-profit focused on coral restoration in Belize.

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**BIO:** Dominique Cobb, a fifth-generation East Tampa resident, is committed to educating and informing residents and local officials about each other to improve understanding and access to government services. She is the Vice Chair of the Hillsborough Preservation Commission and has served as the Economic Development Chair for the East Tampa Community Advisory Committee (CAC). She is also an active gardener, champion for local food production, and volunteers with multiple community gardens, backyard gardens, and fresh food delivery projects in Tampa. Dominique Cobb, a fifth-generation East Tampa resident, is committed to educating and informing residents and local officials about each other to improve understanding and access to government services. She is the Vice Chair of the Hillsborough Preservation Commission and has served as the Economic Development Chair for the East Tampa Community Advisory Committee (CAC). She is also an active gardener, champion for local food production, and volunteers with multiple community gardens, backyard gardens, and fresh food delivery projects in Tampa.

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**ABSTRACT:** My work focuses on creating documentaries that explore and highlight environmental justice issues, primarily seen through the lens of small, often marginalized communities. These films aim to bring attention to the often unseen or overlooked struggles of these communities, grappling with the significant consequences of industrial environmental impacts. "Trash & Burn" (2024) tells the story of Chester, Pennsylvania's 30-year battle against the United States' largest trash incinerator. This facility has caused profound distress to Chester's predominantly black community, showcasing a glaring example of environmental racism in my hometown. The documentary captures the community's resilience and continuous fight against systemic injustice. It's not just about the struggle against the incinerator, but also about the community's spirit and determination to seek justice. Meanwhile, "Midnight Oil" (2020) offers a personal perspective on environmental justice, as it draws from my fifteen-year experience as a steelworker at a major oil refinery. This award winning film delves into my internal conflict – the camaraderie and loyalty I feel towards my fellow workers and the growing realization of the environmental and health impacts our work has on neighboring communities, especially those of color. The documentary captures the complex emotions and challenging decisions faced by individuals in the industry, as they come to terms with the broader consequences of their work on their community and environment. Together, these films aim to shed light on the intersection of industry, community, and the environment, exploring the challenges faced by those living in the shadow of large industrial operations. They highlight the importance of environmental justice and the ongoing fight of communities to protect their health, homes, and futures.



# DECOLONIZING METHODS AND LIBERATORY PEDAGOGIES

11:00 AM – 12:00 PM



# JOEL ALEJANDRO MEJIA

*Associate Professor, Biomedical and Chemical Engineering & Bicultural-Bilingual Studies, Arizona State University*

Whiteness and Racialization in Engineering:  
How Discourse becomes the Norm through Negative Tropes

**BIO:** Dr. Joel Alejandro (Alex) Mejia is an Associate Professor with joint appointment in the Department of Biomedical Engineering and Chemical Engineering and the Department of Bicultural-Bilingual Studies at The University of Texas at San Antonio. His research has contributed to the integration of critical theoretical frameworks in engineering education to investigate deficit ideologies and their impact on minoritized communities, particularly Mexican Americans and Latinos/as/xs in the Southwest United States. Through his work, he analyzes and describes the assets, tensions, contradictions, and cultural collisions many Latino/a/x students experience in engineering through pláticas and testimonios. He is particularly interested in approaches that contribute to a more expansive understanding of engineering in sociocultural contexts, the impact of critical consciousness in engineering practice, and the development and implementation of culturally responsive pedagogies in engineering education.

**ABSTRACT:** The exploration of educational pathways for Latino/a/x engineering students within Hispanic Serving Institutions (HSIs) and emerging HSIs has seen increased attention in recent decades. However, an aspect often sidelined in engineering education research is the profound impact of whiteness and the influence of historical racialization on the educational journeys of Latino/a/x individuals. This seminar critically engages with the historical constructions of race in the United States Southwest Region, an area that hosts the largest population of Latino/a/x engineering students in the nation, to describe how these constructs persist and shape educational trajectories of engineering students. Through a collection of pláticas, a research methodology grounded in Chicana Feminist Epistemology, this longitudinal research explores the evolution of racialization in the U.S. Southwest and its current manifestation in engineering spaces. These pláticas were conducted with 22 participants from Texas and California who were followed for 5 years to explore how racialization and whiteness shaped their engineering trajectories at HSIs and emerging HSIs. Results indicate that negative tropes continue to exist despite the belief that we live in a post-racial society, shaping ideologies of who is an engineer, who does engineering, and who benefits from engineering. By delving into these narratives, the research seeks to reveal how racialization perpetuates deficit ideologies, positioning Latino/a/x engineering students and their communities as inherently "deficient" and thereby constraining their academic and professional endeavors within engineering. This research demonstrates the unintended repercussions of racialization in identity construction in engineering and the persistence of racialized bodies in engineering, showing how the idealization of a homogeneous engineering identity alienates individuals from diverse backgrounds, stifling diversity and impeding progress within the field.



# BRITTANY DAVIS

Rebecca Zarger, Hillary van Dyke, Sherilyne Jones, & Maya Trotz

## “The Most Peaceful Place”: Water and Black Thriving in Tampa Bay

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**BIO:** Brittany Davis is a political ecologist and human geographer. Her research focuses on understanding the social, cultural, economic, and political factors which influence and are influenced by environmental management practices.

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**ABSTRACT:** Understanding and protecting coastal ecosystems is part of the US decadal vision to promote American security and prosperity. Yet often Black folks are left out of discussions about coastal ecosystems and in efforts to build the blue economy. This research stems from a multidisciplinary project focused on connecting upstream and downstream communities to address nitrogen pollution across three watersheds. Activities upstream, including excessive fertilizer use for industrial agriculture, impact the quantity and quality of water downstream, interfering with the health and livelihood downstream and coastal communities. The broader project aims to do this by increasing communications between different stakeholders and using storytelling to humanize nitrogen pollution. This presentation focuses on a subset of the data collected for the broader project, using interviews with Black Floridians to illustrate the need to go beyond treating race as another variable in nature-society scholarship. Specifically, I draw on semi-structured interviews with Black folks in the Tampa Bay, Florida region who are active outdoors. In their interviews, participants described the importance of access to water as a space of and for healing, the connection between access to water and skills for being in the water, and shared stories of their personal experiences on and in the water. Drawing on the Black geographies and Black ecologies literatures, this presentation uses participants' narratives to understand Black spatial matters, reimagine the relationship between Black folks in Tampa Bay and waterscapes, and outline pathways for building a just, equitable, and inclusive blue economy.



# TVETENE CARLSON

*PhD Candidate, Civil and Environmental Engineering  
University of California, Berkeley*

## The Tools of Alaska Native Subsistence, Indigenous Knowledge, and a Just Energy Transition

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**BIO:** I am Ahtna Athabaskan from the Native Village of Cantwell, Alaska. I was raised hunting moose and caribou, berry picking, and walking the land. I got my degree in Civil Engineering from University of Alaska Anchorage in 2018 and am now an environmental engineering PhD student studying tidal renewable energy in rural Alaska. I split my time between experimental fluid mechanics to understand how novel tidal energy systems can capture power efficiently and learning from the Indigenous Knowledge of Alaska Native peoples about how subsistence will be part of the renewable energy transition.

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**ABSTRACT:** My work balances learning from Alaska Native communities about how renewable energy can support Indigenous Knowledge and working on the fluid mechanics of tidal energy development all for the goal of a Just Transition for Alaska Native peoples. My fluid mechanics work is experimental testing of small-scale versions of a tidal energy system in the lab to validate computer model predictions of their power captured. Specifically, I've been testing a newly designed kite system to identify their coefficients of lift and drag, which are the phenomenon that allows planes to fly and this system to turn water current into power. From these experiments I have been able to validate my design team's computer models and assist in further refining the kite's end design. I'm currently running experiments with the help of undergraduate students to explore how lift and drag change due to the addition of roughness that we would expect due to fouling in the ocean. My Indigenous Knowledge (IK) work is investigating how renewable energy development could impact Alaska Native subsistence hunting, fishing, and gathering which is core to our culture and Indigenous Knowledge systems. I used decolonized methods of learning that focus on identifying research questions that serve the community rather than the university and respecting the community's knowledge of their lands and their practices. I accomplish this particularly through semi-structured interviews, participant observation, and experiential learning. I've worked with two communities so far, my own community the Native Village of Cantwell and a tribe on the coast the Metlakatla Indian Community. From this work I hoped to hear what animals and subsistence practices to consider when choosing and siting renewable energy projects. I hope to one day interweave this IK work and my fluid mechanics, but I have yet to thread that needle.



# JUAN LUCENA

*Professor, Engineering; Director, Humanitarian Engineering Program, Colorado School of Mines*

Empowering Students to Empower Communities:  
Research Translation in Engineering Education

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**ABSTRACT:** This presentation shows how “research translation” (RT) can become an established practice in engineering education to connect graduate research and undergraduate learning and provide explicit social relevance of academic research. RT has been defined by USAID as “a co-design process between academics and practitioners, where research is intentionally applied to a development challenge, and embedded in the research project from the beginning so that the result is a tested solution adapted for use as a product, practice, or policy.” While the concept has a long history in other domains, RT remains underapplied in engineering, especially in engineering for community development. In this presentation, we identify barriers and opportunities for the development and implementation of RT in graduate engineering education, especially for those students interested in community development. Then we present four case studies of graduate students in Mines Humanitarian Engineering and Science program who have used RT to connect their research with undergraduate engineering education and with the communities they want to serve. The first case study shows how research on gold processing plants in artisanal gold mining (ASGM) has been translated to teach students how engineering is ultimately a sociotechnical practice and how it can be disseminated so ASGM communities understand the power dimensions affecting their livelihoods. A second case-study describes how RT can be used to teach students community-based research methods and to empower communities at the intersection of ASGM and agriculture to evaluate environmental risks. A third case study shows how research on electronic waste (e-waste) recycling has been translated to teach students about engineering and community development and to empower communities to recycle e-waste in safer and more profitable conditions. A fourth case study shows how research on construction and demolition waste (C&DW) has been translated to teach freshmen engineering students about design for community and to empower communities near C&DW sites how to recycle these materials to diversify their incomes. The presentation concludes with recommendations for how to make RT a more central feature of graduate engineering research.



A large tray of sandwiches and snacks, including bread, cheese, and vegetables, with a semi-transparent text overlay.

# LUNCH AND LEARN

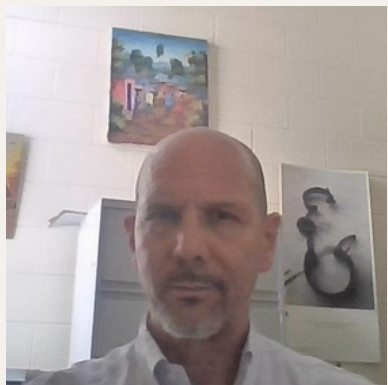
12:00 PM – 1:00 PM

## STEVE FERNANDEZ

Brandon Barret, Breanna Joseph, Esther Kal, Ivor Havkin, Lydia D'Ambrosio, Priya Dalal-Whelan, Tamir Srouji, Trini Marin-Quiros, Bailey Bond-Trittipo, Sarah Brownell, & Corey Bowen

*Engineering Engagement Specialist, University of Massachusetts, Amherst*

Non-hierarchical and Relational Organizing Efforts and Their Impacts on Ending University Partnerships with War Profiteers



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**BIO:** Steve is currently employed in the Diversity, Equity, and Inclusion office in the College of Engineering at UMass Amherst. He works on outreach, community engagement, student support, and he teaches a class in Engineering Service-Learning. His background is in sustainable energy engineering. Steve has worked on the modeling and design of stand-alone hybrid photovoltaic / wind turbine systems. His professional experiences include secondary school STEM education, collegiate service-learning, sustainable energy installations in Latin America, and solidarity engineering projects in marginalized and vulnerable communities in the US.

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**ABSTRACT:** A great deal of engineering efforts are dedicated to developing, improving, and producing weapons of war. In the United States, partnerships with the US military and/or military contractors are very common in engineering education programs. It is also common to find employees of military contractors on university boards. Career fairs are awash with their recruiters. They are also the largest employer of engineering graduates and strategically pursue women and people of color to hire. These ties and associated funding streams lead to prioritization of research related to military ends, rather than technology that serves the common good. This practice exploits vulnerable and marginalized populations both in the US and globally. We will examine recent student efforts aimed at breaking these partnerships, and the power they have for transformative change. Engineering students, working in groups and coalitions with students of all disciplines, are utilizing unique, non-hierarchical, relational organizing practices centered in love and collectivity. Their approach is manifested in how they have people connect, get to know each other, support each other, and collaborate on decisions. They also take time to assess their tactics, discuss criticisms, and learn from their mistakes. Their practices create social and cultural richness that demonstrate an alternative future for engineering after divestment from militarism, one that promotes critical thinking around technology, fosters deep democracy, gives voice and agency to traditionally vulnerable and marginalized groups, and develops communities of love. Students are internalizing processes, methods, and relationships they will take with them after graduation. Large institutions are often slow to change - this is particularly true in STEM. Nevertheless, these student groups are having impacts on the overall sentiments of the student body and in the practices of the university. Soon they will carry their organizing methods out into society to change our discipline and our world.

The background of the slide features a grayscale, semi-transparent image of technical drawings and mechanical components. On the left, there are circular parts resembling gears or pulleys. In the center and right, there are various mechanical assemblies, including what looks like a shaft with a pulley and a gear. The overall aesthetic is technical and engineering-oriented.

# ACCESSIBILITY, UNIVERSAL DESIGN, AND HUMAN CENTERED DESIGN

1:00 PM – 1:50 PM



## TAHIRA REID SMITH & AMOY GEORGE

*Professor, Engineering Education, PSU  
Associate Department Head for Inclusive Research and Education*

### A Call for More Inclusive [Capstone] Experiences in Mechanical Engineering

**BIO:** Tahira Reid Smith is the Arthur L. Glenn Professor of Engineering Education, a Professor of Mechanical Engineering and Engineering at the Pennsylvania State University, the inaugural Associate Department Head for Inclusive Research and Education in Mechanical Engineering, and the director of the Research in Engineering and Interdisciplinary Design (REID) Laboratory. She was also a visiting NASA Scholar from 2020-2021. Her research interests include quantifying and integrating human-centered considerations in the design process and human-machine systems. She has published more than 60 articles in journals, conference proceedings, book chapters, and technical magazines. She has served as the Associate Editor for the Journal of Mechanical Design for three years before joining the editorship of the Design Science Journal. She is the co-founder of a non-profit organization whose public facing name is Black in Engineering (BIE), which convenes 400+ members of the Academic Leadership Network and also serves as the Treasurer. The American Society of Engineering Educators. In 2022, the Society of Women Engineers recognized her with the Emerging Leaders Award. She has been featured in nearly 40 media sources. Her projects that involved the intersection of diversity and mechanical engineering have been featured in media sources including National Geographic, NBC's Today Show, Essence Magazine, Reuters, National Public Radio and many others. A highly sought out role model for the younger generation, Dr. Reid Smith's story about her double dutch jump rope invention is featured in two children's books, was on the 2017 New York State English and Language Arts Common Core Exam administered to over 100,000 4th graders in the state of New York, and was recently featured in the Lemelson Center's Oral History Project and Game Changers Series. Her story can be found in two children's books. More recently, her work on compassionate design, published in the Design Science Journal, garnered the attention of author Nate Regier where her philosophy was featured in his recently book called: "Compassionate Accountability: How Leaders Build Connection and Get Results". In 2011, she completed a postdoctoral position at Iowa State University; In 2010, she received her PhD from the University of Michigan in Design Science, with Mechanical Engineering and Psychology as her focus areas. Dr. Reid Smith received both her BS and MS degrees in Mechanical Engineering from Rensselaer Polytechnic Institute (RPI) in 2000 and 2004, respectively.

**ABSTRACT:** It is well established that among the key reasons women are deterred from engineering programs is their inability to feel a connection to their peers, problems, and contexts being considered in their work. Most women leave because they don't feel they are becoming engineers. With the combination of difficult coursework and alienation in the space, it has been shown that women and minoritized groups do not persist beyond the major. Many programs and researchers are increasing their efforts to make engineering appealing to underrepresented groups. This includes but is not limited to several outreach programs, service learning projects, engineering curricula with considerations on diversity, equity, inclusion, and justice, and summer research opportunities. However, very few have included opportunities that diversified the projects students work on and drew upon the contextual experiences of students. Capstone projects have largely become a required culminating experience for college-level engineering educational programs. Currently, the projects presented to students are typically those associated with traditional mechanical engineering industries. This includes automotive, aeronautical, and military industries to name a few. However, the lack of diversity in capstone projects alienates students whose interests and experiences may vary from traditional engineering paths. In this project, we discuss how offering nontraditional projects can impact both students and stakeholders. Specifically, a total of four student teams worked the following projects: Revealing Mechanical Engineering in Non-Traditional Spaces: Salons and Barber Shops and Inclusive Innovation in Overlooked Spaces: Bring Design Revolution to the Hair or Beauty Care Industry. We collected data through interviews with students who have participated in nontraditional capstone projects. In particular, we show how such projects allow students of all identities to leverage their funds of knowledge in the project.



# NICK TOOKER

*Professor of Practice, Civil and Environmental Engineering,  
University of Massachusetts Amherst*

## Using Creative play as a Springboard for Discussions of Accessibility, Inclusivity, and Equity in an Intro to Civil and Environmental Engineering Measurements Course

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**BIO:** Nick Tooker is a professor of practice at the University of Massachusetts Amherst in the Civil and Environmental Engineering Department. He loves water that is full of possibilities, cooking, sewing, running, and inspiring his students to be more empathetic designers.

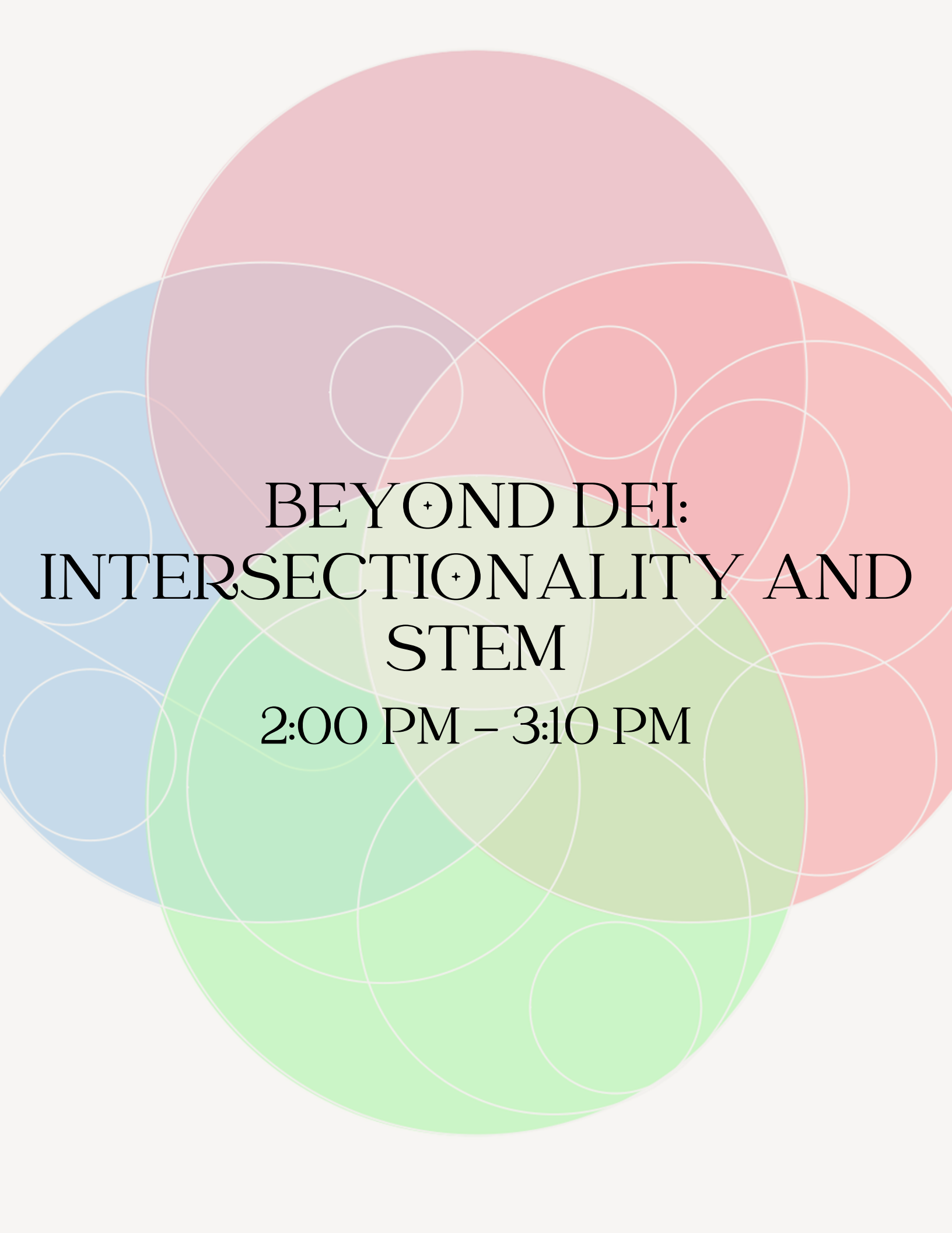
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**ABSTRACT:** Concepts of accessibility, inclusivity, and equity are discussed in my Intro to Civil & Environmental Engineering course. Students choose a stakeholder to consider in their design projects. In Fall 2023, many groups considered stakeholders with physical disabilities. Their building designs were accessible and thoughtful. However, the University of Massachusetts Amherst (UMass) has many inaccessible pathways, which can be difficult for people with physical disabilities to navigate.

In Spring 2024, this cohort of students take a course (Measurements) with a technical focus on surveying. A project was incorporated into this course to apply surveying skills to create an “accessibility map” of UMass. First, I invited stakeholders to discuss their thoughts on campus accessibility, and what our class could create that would be beneficial for them. Students then crafted an approach to making measurements and creating a final product to determine accessible pathways around campus.

Throughout the semester, we discuss concepts related to engineering design including accessibility, inclusivity, and equity. To reinforce discussions, students are given building materials and asked to build representations of those concepts. For our discussion on equity, each student will be given a different number of materials, with some receiving ~5 pieces, and others 100+. Students will use their materials to represent equity. I anticipate they will quickly discover each person has an “unfair” amount of building materials. After building, we will discuss equity and the role that civil and environmental engineers play in designing for equity and justice.

The goals of this presentation are: 1) discuss a case study incorporating accessible design throughout a first year civil engineering course, 2) demonstrate methods for including discussions related to accessible, inclusive, and equitable design through use of collaborative building activities, and 3) provide participants an avenue to brainstorm incorporating concepts of accessible and inclusive design into their own practice.



BEYOND DEI:  
INTERSECTIONALITY AND  
STEM

2:00 PM – 3:10 PM



## SARAH BROWNELL

*Senior Lecturer, Engineering, Rochester Institute of Technology*

### Growing a Transdisciplinary, Community-Engaged “Collaborative Community Capstone”

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**BIO:** Sarah Brownell (any pronouns) is a mother, capstone professor, and aspiring practitioner of Solidarity Engineering from Rochester, NY. She has interests in participatory human centered design, systems practice, co-operative economics, ecological sanitation, fly composting, wasted fruit transformation, and bringing love to engineering work. She has been working at the Rochester Institute of Technology (RIT) since 2010, trying to open up university resources (people, equipment, spaces, funding) for sharing with grassroots groups through community-engaged collaborations in the college of engineering and beyond. Prior to teaching, she co-founded the non-profit Sustainable Organic Integrated Livelihoods (SOIL) which provides ecological sanitation services in Northern Haiti. She also spent a number of years as a live-in volunteer with the Rochester Catholic Worker and volunteered with the Berkeley Catholic Worker while studying in the Civil and Environmental Engineering Masters program at UC Berkeley. She continues to collaborate with various women’s, teachers, and farmers groups in the Commune of Borgne, Haiti as well as with local groups in Rochester on projects of their choosing.

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**ABSTRACT:** Since I began teaching at the Rochester Institute of Technology 12 years ago, I have been striving to bring more community engaged opportunities to engineering students while also liberating university resources for the benefit of grassroots groups. This path has taken twists and turns resulting in the creation of a participatory human centered design engineering elective and a general education course on community engagement, multiple study abroad experiences, and a variety of Multidisciplinary Senior Design (MSD) capstone projects. For three years I have had VentureWell funding to offer a community engaged, transdisciplinary “Collaborative Community Capstone (CCC)” in place of MSD for students who are interested in community focused alternatives to the typical corporate and faculty sponsored projects. The CCC differs from standard MSD in how it is mentored with a focus on community participation, additional learning modules on best practices for community engagement and systems thinking, and a flexible project timeline. However, it still meets the MSD learning goals which map directly to ABET outcomes and counts as a capstone experience for multiple programs. The course has attracted a diverse set of engineering students compared to the engineering student body as a whole and has also incorporated students from liberal arts and industrial design. So far 27 students have completed five projects with partners in Rochester, NY and Borgne, Haiti (where I lived prior to coming to RIT). Anecdotally, more racially diverse teams demonstrated more effort in engaging with the community, felt higher satisfaction from the learning experience, and had better project outcomes. As the grant winds to a close, I would love this chance to share experiences and brainstorm with the WeRise community about how to improve the courses and formalize these rare community engagement opportunities for engineers at RIT.

# BROOKE COLEY

Della Mosley, The Wells Healing Center

*Assistant Professor, Engineering, Arizona State University*

## Supporting Black Engineering Graduate Students through and to Be Great

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**BIO:** Dr. Brooke Coley, an Assistant Professor of Engineering at Arizona State University, is a pioneering force in disrupting the status quo of engineering to create a more equitable and inclusive field where all individuals can thrive. As the Founding Executive Director of the Center for Research Advancing Racial Equity, Justice, and Sociotechnical Innovation in Engineering (RARE JUSTICE), Dr. Coley leads transformative efforts to challenge systemic barriers and promote equity in academia. Her research focuses on amplifying the lived experiences of racially minoritized scholars, dismantling anti-Blackness in STEM, graduate student education, and fostering awareness of, and ultimately, accountability for, the lived realities of individuals navigating STEM through immersive virtual reality experiences. Collaborating with mental health experts, she also is intentional to integrate a head-on focus on the implications for wellness and wholeness in academic environments. Dr. Coley's transparent and culturally responsive approaches, coupled with her dedication and fortitude, have positioned her as a recognized leader in the field. Since 2017, she has secured millions of dollars in grant funding from the National Science Foundation, employing critical qualitative and arts-based methodologies in her work. She received the Betty Vetter Award in 2024 and was named a Virtual Visiting Scholar by the ARC Network in 2023. Launching from the Ph.D. in Bioengineering from the University of Pittsburgh oriented to the challenges of navigating STEM as an underrepresented and minoritized scholar, she continues to lead change and advocate for institutional transformation and accountability through novel applications and approaches.

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**ABSTRACT:** Over the last four years, Black scholars in engineering have shifted from navigating at the intersection of two pandemics, COVID-19 and system racism, to experiencing a time of removed protections and support as associated with the anti-diversity, equity, and inclusion (DEI) legislation that is sweeping the nation and higher education. Antiracism is pervasive in engineering; for Black graduate students, and especially those at traditionally white institutions, it is a critical time as most students remain the “only, only” in their engineering doctoral program, if not one of few, where racialized experiences are a common aspect of the journey. In this community based participatory action research project, 28 (men (n = 13); women (n = 15)) Black engineering graduate students from across the country will participate in a Black Engineering Graduate Student Reunion and Retreat (BE GREAT). Specifically, in this critical moment of the United States, the researchers find two priorities in: 1) understanding the experiences of scholars (inclusive of current PhD students and those that have recently graduated with their PhD) navigating engineering environments amidst the removal of critical supports (e.g., minority engineering programs, DEI resources); and 2) observing how demystifying the discourse around healing in community might serve as a welcoming and accessible space for Black engineers to understand and engage with the vital process of healing. Situated in the Theory of Racialized Organizations and leveraging the Blafemme Healing Framework, this unprecedented event will leverage mixed-method approaches such as the immersive sharing of counterstories in engineering. It remains unknown how Black scholars are experiencing shifting from one trauma in COVID-19 to land in another as in the growing anti-DEI climate of higher education. The research presented in this paper will focus on answering the specific question: how are Black engineering students being supported by their institutions, departments, advisors, faculty, and peers, if at all, to enable them to thrive in this critical time of sustained inequity and injustice? This effort will expand our understanding of the actions that have been taken to position Black students for wellness and success.





Michelle Choi Ausman



Antarjot Kaur

# MICHELLE CHOI AUSMAN & ANTARJOT KAUR

*PhD Student, Engineering Education,  
Virginia Tech*

## Unpacking the Invisibilized History of Asian Americans in Engineering Education

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**BIO:** Michelle Choi Ausman, is a PhD student in Engineering Education at Virginia Tech. She is a biracial Asian American woman of Korean and German descent. Her lived experiences as a member of the Korean American community shapes her interpretation and positionality on this research. She is a graduate assistant for Virginia Tech's APIDA + Center and Asian American, Native American and Pacific Islander Serving Institution (AANAPISI) grant. Her research explores mixed-race and engineering identity formation of undergraduate mixed-race Asian American students in engineering.

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**BIO:** Antarjot Kaur, a first-year PhD student in Virginia Tech's Engineering Education Department, her goal is to blend her Bioengineering background with a passion for equity in engineering education. As a Desi-American woman, she's committed to fostering inclusivity, particularly for underrepresented students. With a vision for a more equitable future, Antarjot aims to drive meaningful change as both a scholar and future faculty member.

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**ABSTRACT:** In Engineering Education Research, Asian American students are not considered a minoritized population but “overrepresented,” as they are the largest racial group after their White peers. Due to this, Asian American students are often lumped together with White students when disseminating quantitative racial data. At the same time, they are considered a minority population through the U.S. Department of Education’s Asian American, Native American and Pacific Islander Serving Institution (AANAPISI) designation. This dichotomy places Asian American students into a peculiar position for Engineering Education and STEM education researchers. Harmful stereotypes, such as the “model minority”, perpetuate the assumption that Asian American students are equal to their white peers. Despite being considered equal to their White peers, Asian American students still encounter racialized and xenophobic experiences in classrooms, labs, and in industry. Though diversity, equity, and inclusion initiatives in engineering have become more pronounced, they tend to leave out and ignore support for Asian American students. More inclusive policies, therefore, need to be built on a better understanding of how they perceive their cultural identity and how such a cultural identity intersects with their professional identity. Unfortunately, there have been limited studies in STEM and engineering education on Asian American students’ experiences in STEM majors. In this presentation, we will highlight how excluding Asian Americans explicitly enforces whiteness within engineering. We will discuss the long historical context and legislation of Asian American exclusion in the United States. We will also discuss and examine various forms of micro/macroaggressions and stereotypes which are invasive to the Asian American experience in engineering. We hope that our contribution will bring voice to Asian American engineering students, which are often silenced and invisibilized within STEM fields and disciplines.



# MARJORIE FONTALVO

*Department Undergraduate Advisor, University of South Florida*

## How Welcoming Is your University/College to Women and Minority STEM Students?

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**BIO:** Marjorie Fontalvo, currently serves as a Senior Program Advisor to the Computer Science and Engineering programs at the University of South Florida. She serves on the University's Presidential Advisory Committee for the Status of Latinos (SOL) and the Committee on Accessibility. She is currently serving as Director of Membership in the American Association of University Women (AAUW) for the state of Florida and is involved in TechTrek. She holds a Doctorate and undergraduate degree from Florida State University, Tallahassee, FL and holds a master's degree from Nova Southeastern University in Ft. Lauderdale, FL.

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**ABSTRACT:** The purpose of this session will be to provide advisers with the tools of program evaluation to assist in assessing their local setting on how friendly are towards underrepresented students seeking a STEM Degree. I will first provide a brief overview of my problem of practice and how I went about improving my advising realm using program evaluation. Each program/ educational setting has unique characteristics that a student has. adviser, professor, and other stakeholders are seen as important. How do you as an adviser bring some of the underlying issues to the surface and how can you help your students succeed? Program Evaluation can be used as an advising tool that can help advisers, and produce lasting improvements to your program. How do you as an adviser bring some of the underlying issues to the surface and how can you help your students succeed? Program Evaluation can be used as an advising tool that can help all educational practitioners a way of improvement their programs.



INFRASTRUCTURAL JUSTICE  
AND COMMUNITY ENGAGED  
SCHOLARSHIP  
3:25 PM - 4:35 PM



KebreAb  
Ghebremichael



Sarina Ergas



Rita Ortiz

# KEBREAB

# GHEBREMICHAEL

Sarina Ergas, Allan Feldman, & Rita Ortiz

*Professor of Instruction, Global Sustainability & Civil and Environmental Engineering; Director of Water and Sustainability*

## Engaging High School Students in Ghana in Authentic Water and Sanitation Research

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**BIO:** Dr. KebreAb Ghebremichael is Professor of Instruction at the Patel College of Global Sustainability, University of South Florida. He is Director of the Water Sustainability Concentration. Before joining USF, he worked at UNESCO-IHE in the Netherlands and the University of Asmara in Eritrea. He worked in academia for more than 25 years. His research area focusses on water and wastewater treatment, particularly in the development of low cost and appropriate technology, systems thinking for analyzing the water food energy nexus and impact of climate change on water supply. He is involved in national and international projects funded by Federal, State and Foundation grants. Dr. Ghebremichael has published one book, 4 book chapters, and more than 30 peer-reviewed journal papers. Recently he received a Global Achievement Award at USF and a prestigious Carnegie African Diaspora Fellowship award for education and international research projects. He holds a Ph.D. in Water Resources Engineering from the Royal Institute of Technology in Sweden, MSc in Water Engineering from the University of New South Wales in Australia and BSc in Civil Engineering from Addis Ababa University in Ethiopia.

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**BIO:** Dr. Ergas is a professor in the Department of Civil & Environmental Engineering at the University of South Florida. Her research expertise is in environmental biotechnology, including bioremediation, nutrient removal and biological waste-to-energy technologies.

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**BIO:** Rita Ortiz is a Ph.D. candidate in the College of Education at the University of South Florida. Her research focuses on science teacher education, particularly on ecojustice education for preservice teachers. Her background also includes experience serving as an in-field supervisor for secondary clinical education. She was a high school biology teacher before starting her doctoral studies.

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**ABSTRACT:** Globally there is a need for efforts to address water, sanitation, and waste management challenges. Although attempts have been made to develop low-cost water and waste management systems, many fail in practice due to the lack of community engagement and understanding of socio-economic factors. This NSF funded project engaged 15 US students from various disciplines and ~ 97 Ghanaian high school students over three years. They engaged in research to develop and test water and waste management technologies, while uncovering social factors that limit their use. The Ghanaian high school students participated in authentic science and engineering research activities, including developing research questions, designing experiments, making measurements, data analysis and research communication. Model biosand filters and biodigesters, built from low-cost or repurposed materials, were used to introduce physical and conceptual models, while learning about water purification, anaerobic digestion, and sustainability. Students collected and analyzed data and interpreted their results to answer their research questions and make recommendations for school level biosand filter and biodigester implementation. An ethnographic approach was utilized to collect data using observations, review of artifacts, interviews, and pre- and post-tests. The Ghanaian students indicated that the project increased their knowledge of science, ability to engage in science practices, interest in STEM-related careers, and that the project had a positive impact on their perceptions of themselves as scientists. For US students, participation in this project enhanced their research skills and the global competence needed to work effectively in developing countries. In addition, they gained teaching experience while investigating research questions in a low-stakes environment.



Seunghyun Lee



Paola Larosso

# SEUNGHYUN LEE

Paola Larosso, Kenichi Soga, & Louise Comfort

*Post-Doc, Civil and Environmental Engineering  
University of California, Berkeley*

Addressing Social Vulnerability  
in Wildfire Resilience

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**BIO:** I am a postdoctoral scholar in the Civil and Environmental Engineering Department at the University of California, Berkeley. I am contributing to the NSF-funded Smart and Connected Cities (SCC) project aimed at reducing wildfire risk in Northern California. I received my Ph.D. in Public Administration and Policy from the Graduate School of Public and International Affairs at the University of Pittsburgh. My research focuses on the dynamics of cross-jurisdictional and cross-sectoral organizational networks in emergency and crisis management contexts.

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**BIO:** Paola is a PhD student in Civil Systems at UC Berkeley. Her current research interests go around wildfires and evacuation simulations in emergency situations.

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**ABSTRACT:** Recent extreme wildfires have revealed significant challenges to disaster resilience in vulnerable communities. Unlike localized structure fires, wildfires spread from community to community, taking a toll on lives and properties without limits. While environmental factors like weather, topography and fuels influence wildfire spread, socio-economic status significantly impacts both short- and long-term effects. For example, many evacuees, especially seniors, lost their lives during the Camp Fire in California in 2018 and people who evacuated from recent wildfires to designated shelters were mostly from socially vulnerable population groups. This research examines the status of population groups with social vulnerabilities in wildfires, providing a rationale for vulnerability-focused disaster preparedness and identifying areas requiring heightened attention and resources. We have conducted over fifty interviews with community leaders and stakeholders in two counties in northern California at risk from wildfire. Interview findings suggest that recent wildfires in California have highlighted the vulnerability of diverse populations, particularly those in need of language interpretation, medical assistance, support for mobility, low-income families, and immigrants lacking close family support for temporary housing. Insights from these interviews identified key factors that exacerbate social vulnerability in wildfires, which were then mapped to explore socially vulnerable geographic areas. These findings, combined with an analysis of high-risk wildfire zones, contribute to the development of wildfire evacuation simulations. This study's findings underscore the critical need to integrate social vulnerability factors into disaster preparedness and mitigation, ensuring that disaster management plans effectively address the diverse needs of at-risk populations. By illustrating the geographic distribution of social vulnerability in wildfire-prone areas, this research provides insights for stakeholders to enhance preparedness and response strategies, contributing to more effective and equitable disaster resilience efforts.



Jonathan Gaines



Laura Sams Haynes

# JONATHAN GAINES

Paola Larosso, Kenichi Soga, & Louise Comfort

*Associate Chair for Inclusive Excellence, Mechanical Engineering, Georgia Tech*

GT PRIME - a summer camp for relationship building, mentorship, and empowerment through engineering

**BIO:** Dr. Jonathan Gaines is the inaugural Associate Chair for Inclusive Excellence with the Woodruff School of Mechanical Engineering at Georgia Tech. In this role, he develops programming and initiatives focused on building community for faculty, staff, students, and alumni. Previously, he was the Assistant Director for Engineering Innovation at the Atlanta University Center Consortium where he worked to grow and improve its Dual Degree Engineering Program at Morehouse College, Spelman College, and Clark Atlanta University. Dr. Gaines also was faculty at the University of South Florida for ten years in the Mechanical Engineering Department where he held administrative roles including inaugural Director of First-year Experiential Education and Learning. His expertise is in data acquisition, robotics, and engineering education with an emphasis on engineering identity research, service learning, and culturally responsive mentoring.

**BIO:** Dr. Laura Sams Haynes is Director of the Office of Outreach in Electrical and Computer Engineering at GA Tech and is also faculty advisor for WECE (Women in Electrical and Computer Engineering), BLIECE (Black, Latino, and Indigenous in ECE), and BGSA (Black Graduate Student Association). Deeply committed to the mission of diversity, equity, inclusion, access, and advancement through higher education, she is engaged in increasing the available pool of women, underrepresented students, and diverse faculty in ECE through K12 outreach and HBCU partnerships and collaboration.

**ABSTRACT:** ABSTRACT: The Woodruff School of Mechanical Engineering at Georgia Tech is implementing a summer outreach program entitled Georgia Tech Promoting Relationships, Identity, and Mentoring through Engineering (GT PRIME). The program will invite rising seventh and eighth graders to participate in a social justice themed robotics camp where they will be teamed with an undergraduate engineering student or an in-service teacher that works or has worked as a school guidance counselor. Each week will address specific themes in each of three focus areas 1. Community engaged design, 2. Leadership and life skill development, and 3. Dismantling of anti-Black racism. The camp will allocate equal time to design project tasks, relationship building tasks, community building tasks, and learning of how technology can be used to impact relevant social justice issues. At the end of the summer camp, all participants will participate in a rites of passage ceremony where they will reflect upon the significance of the experience. Teacher participants will complete a close out project where they develop a plan on how to infuse the themes and experience of the camp into how they generate interest around robotics and social justice with Black middle school students. This work is a direct follow-up to work completed at the University of South Florida with money awarded from an internal grant to address and mitigate anti-Black racism. The format of the camp is adopted from a separate summer camp implemented at USF through the Broadening Participation in Engineering program.



# TINA CHOW

Kirk Bergstrom, Casey Finnerty, Matt Holmes, Jennifer Hoody, Bavisha Kalyan, Ector Olivares, Jonathan Pruitt, Tanisha Raj, Jermaine Reece, Rebecca Sugrue, J. Daniel Taillant, & Courtney Turkatte

*Professor, Civil and Environmental Engineering,  
University of California, Berkeley*

Design for Global Transformation: Systems Thinking for a  
Community-Engaged Engineering Design Course

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**BIO:** Tina's research group aims to improve the numerical models used for weather prediction and air quality forecasts. She and her students have worked on predicting how wind turbines respond in turbulent flow, how wildfire smoke spreads, where pollution is distributed in an urban environment, and how winds are affected by complex mountainous terrain, among other applications. Tina received a B.S. in Engineering Sciences from Harvard University and M.S. and Ph.D. degrees in Civil and Environmental Engineering from Stanford University. She has been a professor in Civil and Environmental Engineering at the University of California, Berkeley, since 2005, where she teaches fluid mechanics, numerical modeling, and community-engaged design courses.

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**ABSTRACT:** Global transformation starts at the local scale, where decision makers can contextualize socio-economic and political factors to design communities that are resilient to climate change and environmental hazards. This "systems change" approach provides the foundation for a new community-engaged design course for undergraduate engineering students at UC Berkeley. In this course, students work closely with environmental justice (EJ) organizations in nearby Stockton, California, to support California's initiative to improve air quality in priority communities (AB 617). Representatives from EJ organizations provide expertise and direct mentorship to student groups to set goals and help guide design projects. Design Science is taught together with systems thinking and systems mapping as a framework for enabling local to global change. Student projects have included discussion of the history of disadvantaged communities in Stockton, focusing on disparities in air quality, housing, tree cover, transportation, etc.

Students have analyzed data, developed visualization tools, and created design plans in areas such as agricultural burning, urban greening, air quality monitoring, warehouses, heavy-duty truck traffic, and shipping, to help with ongoing AB 617 implementation plans. With a systems thinking approach, students look at not just which specific industries are polluting the air, but also the history and current policies and social issues which allow ongoing and even growing pollution from these industries, despite demonstrated inequities in the local pollution burden and associated health impacts. By providing support through technical analysis, mapping of permits, emissions, and air monitoring data, and other engineering and outreach tools, students help the community continue to advocate for change.



# JESSICA BOAKYE

*Assistant Professor, Civil and Environmental Engineering,  
University of Massachusetts Amherst*

Quantifying social sustainability for  
deteriorating pavement systems

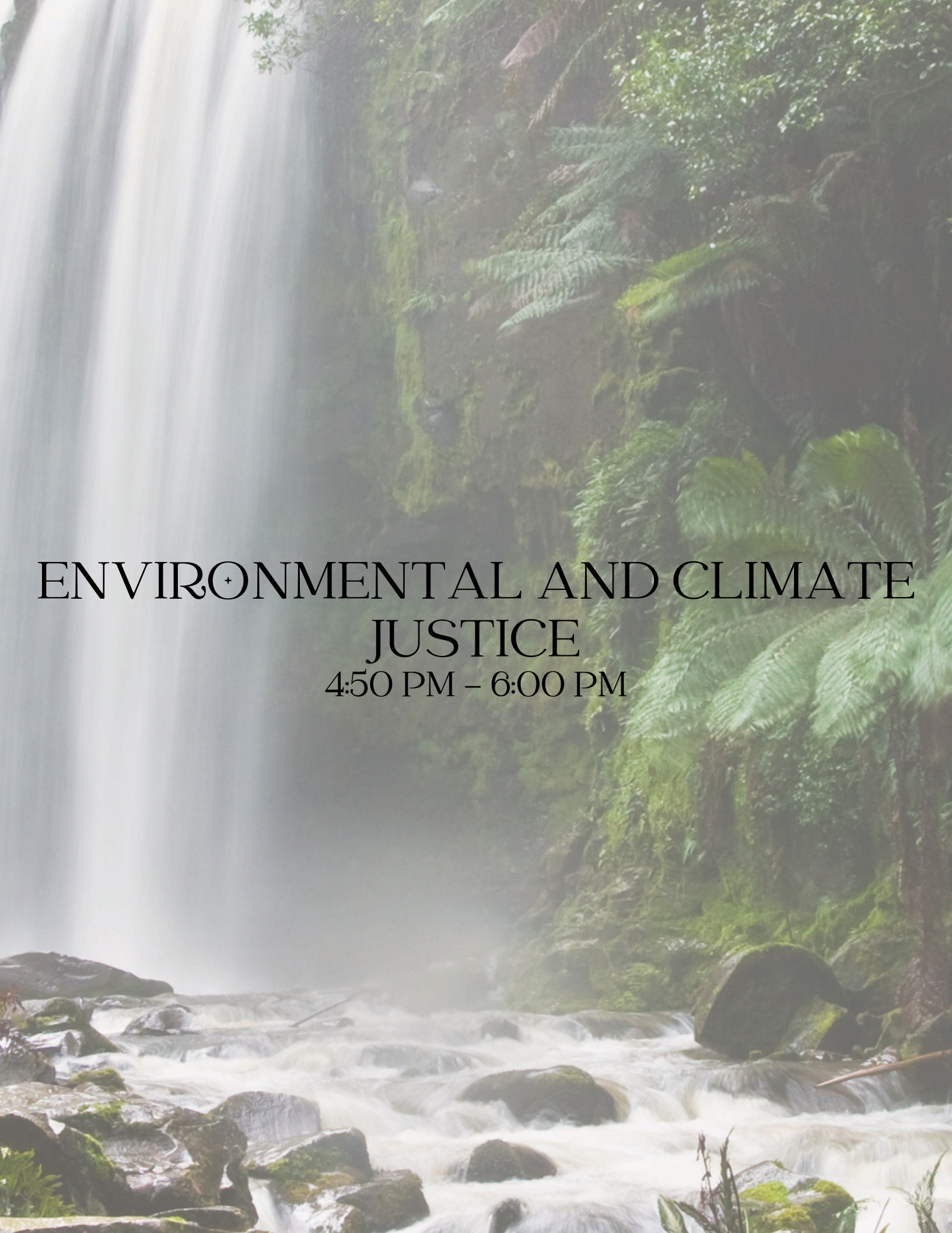
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**BIO:** Jessica Boakye is an Assistant Professor of Civil and Environmental Engineering at the University of Massachusetts Amherst. Her research focuses on quantifying, predicting, and mitigating the societal impacts of infrastructure network disruption due to a multitude of factors including deterioration, hazards, and availability.

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**ABSTRACT:** Sustainable pavement management requires satisfying the social, economic, and environmental pillars of sustainability. While the economic and environmental pillars have been well studied, social sustainability (and factors that describe them) have been understudied. Moreover, pavements (like most of our nation's civil infrastructure) are in varying levels of decay with some parts in better condition than others. Past research has shown that poor pavements can have negative impacts on public health and user costs. These negative impacts often disproportionately impact environmental justice communities. This work presents a methodology for quantifying the impact of pavement deterioration on Environmental Justice (EJ) populations. Two impacts are considered. First, the distribution of pavement conditions within EJ and non-EJ communities was considered. This impact was chosen as a proxy for public health since poor condition roads have been linked to increased negative health impacts such as higher asthma rates, lower air quality and, higher noise. Second, excessive fuel consumption due to road condition was examined within EJ and non-EJ communities. Fuel consumption during home-work trips was used for analysis. Work trips are chosen because they are essential, repeatable, and publicly available from the US census. The methodology is illustrated using Massachusetts as a case study location. The definition of EJ communities was obtained from the Massachusetts Department of Transportation. Findings show that EJ communities are twice as likely to live near poor-conditioned roads and consume up to twice as much excessive fuel during recurrent home-work trips. Data used in the study is publicly available to demonstrate applicability and transferability.





ENVIRONMENTAL AND CLIMATE  
JUSTICE  
4:50 PM – 6:00 PM



## LUPITA D. MONTOYA

*Community Energy Fellow, DOE*

### Dismantling Environmental, Energy, and Climate Injustice: A Reverse-Engineering Approach

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**BIO:** Dr. Lupita D. Montoya has conducted community engaged research that addresses environmental and health impacts of indoor air pollution in underserved communities since 1999. She is the first Chicana to earn a PhD in Environmental Engineering at Stanford University and the first engineer to receive the Yerby Postdoctoral Fellowship at Harvard School of Public Health. Dr. Montoya is a first-generation engineering scholar and proud graduate of the California State University system. Dr. Montoya is chair of the Representation and Equity Affairs committee of the American Association for Aerosol Research and co-chair of the Diversity, Equity, and Inclusion committee of the Tau Beta Pi Engineering Honor Society. She is co-PI of the NSF ADVANCE SPACES (Strategic Partnership for Alignment of Community Engagement in STEM) grant. She is presently a Department of Energy Community Energy Fellow embedded in Harris Count TX, where she is supporting the development and implementation of their Climate Justice Action Plan.

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**ABSTRACT:** Recent calls for environmental, energy, and climate justice evoke memories of past movements, which promised unrealized improvements in the quality of lives of marginalized people in the US. These new voices are welcome reinforcements and come at a time when challenges like climate change are no longer academic discussions but a reality. Dismantling persistent systems of injustice is a critical part to addressing this existential challenge. Eradicating racism in science and engineering is part of a larger quest for justice and it requires a holistic approach that goes beyond the inhospitable halls of institutions of higher education. It necessitates we inhabit and interrogate spaces like non-profits and government, as well.

This presentation will illustrate how reverse engineering has been used to understand the inner-workings of environmental, energy, and climate injustice, while looking at the academic, non-profit, and government spheres in the US. Reverse engineering is a process by which a product is deconstructed to extract design information from it. The process is often used to increase the quality and efficiency of parts, or to reduce cost. The disassembling and analysis process is then followed with a reassembly and the creation of an improved product. In this case, the improved product would be environmental, energy, and climate justice. Understanding the links among these spheres is also critical, but they are often missed. Community engaged research can be an invaluable tool to bring these seemingly disparate spheres together and to illuminate the incongruencies that lie in the un-interrogated spaces. The presentation will close with a discussion on how this knowledge is being leveraged through a US DOE Community Energy Fellowship in the development and implementation of a Climate Justice Action Plan in Harris County, TX.



Abby Vidmar



E. Christian Wells

# ABBY VIDMAR

E. Christian Wells, Deirdre Cobb-Roberts,  
Michelle Henderson, & Maya Trotz

*PhD Student, Applied Environmental Anthropology,  
University of Southern Florida*

## Engineering Environmental Justice through Community Engaged Teaching

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**BIO:** PhD student at the University of South Florida in Applied Environmental Anthropology. Currently working in the Center for Brownfields Research & Redevelopment lab. Teaching assistant for the Department of Anthropology. Research interests include environmental justice, critical energy transitions, water and sanitation infrastructure insecurity, and green liberation.

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**BIO:** Dr. Christian Wells (BA, Oberlin College; MA, PhD, Arizona State University) is professor of Anthropology and director of the Center for Brownfields Research & Redevelopment at the University of South Florida, where he served previously as the founding director of the Office of Sustainability and as deputy director of the School of Global Sustainability. He is a fellow of the American Association for the Advancement of Science and currently serves as an interdisciplinary research leader with the Robert Wood Johnson Foundation. Dr. Wells is an applied environmental anthropologist whose research aims to improve human and environmental health outcomes of re/development efforts in underserved communities. He recently received the 2023 Environmental Justice Spirit of Excellence Award from the Florida Brownfields Association and the 2023 Wesley W. Horner Award from the American Society of Civil Engineers. He is also the recipient of the Black Bear Award from the Sierra Club in recognition of outstanding dedication to sustainability and the environment.

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**ABSTRACT:** In this reflective paper, we discuss our efforts—as activist scholars—to cultivate a critical environmental justice perspective among anthropology and engineering students through a community-engaged seminar at the University of South Florida. Undergraduate and graduate students in the course participated in a semester-long effort to work with community residents to explore the past, present, and future of environmental justice challenges in the historically Black community of East Tampa. Students worked with residents to document their stories using community-engaged oral history, a mode of critical qualitative inquiry that employed a participatory method of collecting, interpreting, and preserving the voices and memories of East Tampa residents. Because the practice of oral history requires a personal engagement between interviewer and interlocutor, it enabled students to see beyond individual stories to the broader social, political, and economic contexts in which people experience structural racism and environmental injustice. Pre- and post-course surveys with students document how this approach also allowed them to contemplate their positionality in relation to environmental justice challenges and construct meaningful ways to contribute to justice initiatives.



# LESLEY JOSEPH

*Faculty Fellow in the Department of Civil and Environmental Engineering at the University of South Carolina*

Examining the disparities in landfill siting in South Carolina, United States: An Environmental Justice Analysis

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**BIO:** Dr. Lesley Joseph is currently a Faculty Fellow in the Department of Civil and Environmental Engineering at the University of South Carolina. His research focuses on environmental justice issues related to waste management, along with water and wastewater infrastructure. He received his BS, MS, and PhD from the University of South Carolina, along with a Master's of Science in Environmental Engineering from Johns Hopkins University. Dr. Joseph is also a licensed professional engineer (PE) with over 10 years of experience in the design of water/wastewater conveyance and treatment plant projects, along with project management and construction inspection services.

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**ABSTRACT:** Landfills are a significant source of environmental degradation, and their presence has been linked to air pollution, climate change, water contamination, and various other negative impacts to human and natural ecosystems. Studies have shown that communities that live near landfills experience increased risks of various health issues, including respiratory illness, various forms of cancer, and low birth weight among newborns. Given the potential threats to human health posed by landfills, a significant amount of environmental justice research has focused on the siting of these types of facilities and the uneven exposure burden that they pose to various underserved communities. Since the inception of the environmental justice movement, the disproportionate siting of landfills has been a concern. The purpose of this study is to examine the spatial distribution and potential disparities of landfills in South Carolina, which has not been examined from an environmental justice perspective. Data for the landfills throughout South Carolina were gathered using publicly available documentation from the South Carolina Department of Health and Environmental Control, and the landfills were geocoded and mapped using Geographic Information Systems (GIS). This study utilized demographic data from various sources, including the 2020 Census Bureau, EJ Screen, and the Centers for Disease Control and Prevention (CDC). Preliminary analysis shows a disproportionate exposure of African Americans to landfills. Moreover, median household incomes in census tracts with landfills are statistically lower than in census tracts without landfills in South Carolina, and census tracts with landfills demonstrate a significantly higher level of social vulnerability. The information from this study will help identify the communities that may be vulnerable to the health impacts associated from landfilling and assist state and local policymakers in making decisions that will protect them and improve community development efforts across the state.



# FREDRICK WOMACK

*Executive Director of Operation Good*

## Tired of Being a Commodity

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**BIO:** Fredrick Womack, descendant of the Atlantic Slave Trade, grandson of slain sharecropper, prisoner of The State of MS, commodity of the United States. Fredrick Womack is a highly decorated U.S. Army veteran and businessman from Jackson, MS who is committed to interrupting cyclical violence and building unity in the community. To say that Fred Womack is passionate about this work is an understatement. Through several initiatives and programs spanning over two decades, he has actively worked to reduce violence, repair harm, and rebuild his community. As the Founder and Executive Director of Operation Good, Mr. Womack leads the first and only violence intervention organization in the city of Jackson and state of Mississippi. Leaning on his experience navigating the streets and the battlefields, he knows that most violent acts are committed from a place of despair or broken relationships. He recognizes there is a price that comes with violence that impacts each of us, including our children, and therefore, Mr. Womack's work is rooted in the philosophy of mending fences. He believes that restoring individual relationships strengthens the collective. Mr. Womack is a devoted father, son and community activist in his own right. Moving as one with other community leaders by reaching out to meet the needs of the people in each neighborhood, Mr. Womack brings solutions to those in conflict with themselves and others. He shines the light on mental health, sociological, physiological and economic disparities, attempting to bring aid to the less fortunate and their families. He seeks to gain understanding, spread peace and share life skills that aid in the reduction and eradication of violence in the streets and the Jackson Metropolitan area. The reputation of Mr. Womack and Operation Good has gained him the trust, respect and reliance of local leadership, healthcare teams, community members and neighborhoods alike to do good works. Mr. Womack has a B.S. Degree in Biology from Jackson State University and a MBA from Belhaven University.

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**ABSTRACT:** We work in Healing the wounds of the descendants of the Atlantic Slave Trade that was inflicted with massive injuries by slavery and continuously bombarded with lashes by systemic racism. These wounds lead to my community being one inflicted with violence, over ran by highly addicted man made narcotics, broken homes, dysfunctional families, poor education, homeless children, dilapidated housing, food deserts, crumbling infrastructure, poor drinking water, poor water quality, poverty, mental health issues, Willie Lynch syndrome, mass incarceration, poor health care and every week in my city the biggest event is funerals. We go about healing these wounds with being a support to the "NOBODIES." We view that the original use of my people was to be a commodity and today they still remain a commodity for the economic wheel of America. From the news reel, to entertainment, to prisons and to the graveyard, my people are always at the forefront. Keeping the news media full of stories about gun violence in the inner cities where its predominantly black. Blacks don't manufacture guns but they are the number 1 victim of them. Blacks don't manufacture caskets, but blacks fill the graveyards. The private industrial prison complex is bankrolled with blacks being imprisoned. We work to reduce violence amongst those in the inner city, we support the less fortunate by supplying clean drinking water, fresh foods, hygiene products, educational needs and housing needs. We advocate for those who feel they don't have a voice. We protest for those who are living in harsh conditions in the prison systems. We work with our youth who comes from broken homes, victims of violence or homeless.



# CLOSING REMARKS

Maya Carrasquillo & Michelle Henderson



# POSTER PRESENTATION AND RECEPTION

6:10 PM - 7:30 PM

# POSTER PRESENTATIONS

## SAMANTHA BECARIA

*Undergraduate Student, Environmental Engineering Science,  
University of California, Berkeley*

### LA Heat Risks in a Warming World



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**BIO:** Samantha Becaria (she/her) is a rising junior at UC Berkeley majoring in Data Science. She was born and raised in Cerritos, California in which her current research is focused on. She is currently an undergraduate researcher in Dr. Justin Remais's Lab under the Department of Public Health where she is assessing the incidence rates of coccidiomycosis (Valley Fever) in California State Prisons. She would like to thank her mentors Dr. LaDochy and Dr. Li at Cal State Los Angeles who supported her throughout her research project.

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**ABSTRACT:** The Urban Heat Island (UHI) effect is a growing concern as heat waves intensify, particularly in densely populated urban areas like Los Angeles (LA). This phenomenon causes significant elevated temperatures within cities compared to its surrounding rural areas. In Los Angeles, factors such as prevalence of heat absorbing surfaces, the removal of vegetation, and air pollution all play a significant role on UHI. The UHI effect in Los Angeles has significant implications for public health, often associated with heat-related illnesses, cardiovascular issues, respiratory problems, and risks during pregnancy, especially with vulnerable populations like the elderly and children. As the relationship between health and heat continues to deepen, it is necessary to identify which regions in Los Angeles will be the most impacted. Using GIS technologies we can plot the most significant factors of UHI as health data to understand more about the groups who are experiencing the brunt of the effect. All data was sourced directly from the City of Los Angeles, CalEPA's Urban Heat Island Index and the California Healthy Places Index. We found there to be a correlation between median household income and heat related health illnesses. However, more research must be done on other factors such as the UHI during different times of day (late nights, early mornings) as well as seasons (winter vs. summer). We hope to display our findings in a public dashboard that can be used by non-profit organizations and other agencies when prioritizing where to distribute resources during extreme heat events.



# POSTER PRESENTATIONS



## HANNAH WHARTON

*PhD Student, Civil and Environmental Engineering  
University of California, Berkeley*

### Soil-SEQ: Hands-on Bioinformatics Module for High Schoolers

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**BIO:** Hannah is a second year Environmental Engineering PhD student in the Pickering lab at UC Berkeley. Her research interests focus on investigating pathogen transmission in low-income settings and the impacts of WASH interventions on transmission pathways.

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**ABSTRACT:** Cutting-edge, portable DNA sequencing technologies have the potential to make bioinformatics and genomics more accessible to underserved communities, including academic institutions in low- and middle-income countries. Antimicrobial resistance (AMR) is increasing rapidly, with low resource settings facing the highest burden of disease, as many common pathogens are showing increasing AMR. Environmental surveillance utilizing DNA sequencing has the potential to increase understanding of AMR transmission and inform public health protocols. We have developed a hands-on learning module, called Soil-SEQ, that teaches AMR research approaches to high schoolers. The goal of this hands-on module is 1) to determine whether Soil-Seq increases career interest in environmental engineering, microbiology, and other science fields for participating high school students and 2) to facilitate collection and sequencing of soil metagenome data from environmental samples collected by students around the globe. Students will act as citizen scientists, while learning the protocols used in research labs for environmental surveillance of AMR. Students will collect soil samples from their local area and then learn how to run their own bioinformatics analyses and determine types and genomic context of AMR genes present in their samples. Students will then contribute their results to a database that will host AMR detection rates globally using portable Nanopore sequencing. Leveraging environmental samples sequenced by citizen scientists and stored in a central data base will provide large amounts of genomic data to help better understand and reduce the dangers of AMR, while increasing student's exposure to the public health applications of environmental engineering. Utilizing Nanopore through this project will increase access to AMR data in low resource settings and make reference databases more representative of low resource settings which could help reduce the spread of AMR.

# POSTER PRESENTATIONS



## SERENA ECHOLS

Emily Walsh, Joshelyn Guimaray, Sara Roman, E. Christian Wells, & Sarina Ergas

*M.A. Applied Anthropology, Master of Public Health,  
University of South Florida*

Zombie Ponds! Collaborative Co-design of  
Green Infrastructure to Improve Stormwater  
Management

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**BIO:** Serena Echols is from Chicago, Illinois and recently received her B.S. in Environmental Science at Spelman College. Currently, she is pursuing a double masters in Applied Anthropology and Public Health at the University of South Florida. She is an environmental advocate with a passion for placemaking, placekeeping, and justice for communities of color. Serena's adventurous spirit drives her to address environmental disparities affecting both the environment and communities.

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**ABSTRACT:** Stormwater ponds are important forms of green infrastructure designed to attenuate the flow of nutrients into the Tampa Bay estuary, which can cause harmful algal blooms that produce toxic effects on people and marine life. However, with increasing frequency and intensity of coastal flooding due to climate change, many stormwater ponds have become inert “zombies” characterized by poor water quality that negatively impacts human and environmental health. This research works with community residents and environmental engineers to co-design solutions to one zombie pond in Tampa’s University Area Community, a disadvantaged underserved urban community. Students are working with USF faculty and graduate students in anthropology and environmental engineering to conduct interviews, focus groups, and participant observation with residents and engineers to assess how both groups can engage in collaborative design with the principal of “reciprocal engagement,” which leverages mutual support for joint action.

# POSTER PRESENTATIONS



## ADRIANA MAYR MEJIA

Abby M. Vidmar, Grey W. Caballero, Estenia Ortiz Carabantes, Valerie Bullock, Cedric McCray, E. Christian Wells, Michelle Henderson, Maya Carrasquillo, & Maya Trotz

*Undergraduate Student, Civil and Environmental Engineering, University of South Florida*

Rehabilitating Neglected Stormwater Ponds: A Student-led, Community-Engaged Approach

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**ABSTRACT:** In urban regions of Florida, stormwater ponds are often constructed to reduce runoff and nutrient discharges to surface water resources in efforts to protect the environment. However, in underserved communities, which typically have less greenspace and more hardscaping, these ponds often do not function according to design and instead threaten human and environmental health by concentrating water that becomes impaired by P, N, industrial and commercial contaminants, failing septic systems, sewer overflows, and solid waste. This poster describes the results of a community-engaged university seminar on environmental justice where students considered the disproportionate environmental health impacts of neglected stormwater ponds in three historically segregated African American communities in East Tampa. Students conducted research on archival documents and existing data, water quality (dissolved oxygen, pH, total coliform, nutrients, heavy metals), and interviews with area residents and city officials about challenges and opportunities regarding cleanup and redevelopment. The results, which included a series of videos that feature the voices and perspectives of community members, are being used to create redevelopment plans to turn neglected ponds into community assets as identified and prioritized by local residents.

# POSTER PRESENTATIONS



## LESLEY JOSEPH

*Faculty Fellow, University of South Carolina*

Examining Food Access and the Food Environment at Historically Black Colleges and Universities (HBCUs) in South Carolina

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## KRINA PATEL

*PhD Student, School of Education, University of California, Berkeley*

Unveiling the Influence of Whiteness in Product Design

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**BIO:** Krina is a second-year graduate student at UC Berkeley. Her research focuses on promoting inclusive, supportive, and educational experiences in undergraduate engineering courses. She has previous research experience in design thinking, engineering education, and organizational psychology.

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**ABSTRACT:** What is whiteness? Whiteness is a socially constructed concept at the intersectionality of race, identity, and privilege that exploits power. Whiteness represents a “racial identity that is experienced, reproduced, and addressed by those diverse white men and women who identify with its common sense assumptions and values (Roediger, 1994).” However, it extends beyond one’s skin color and encompasses complex cultural, historical, and systemic dimensions. Through these dimensions, whiteness often shapes the structure of power and privilege that influences our society. It upholds certain conventions deemed acceptable by society, and what remains beyond those bounds is met with disapproval (Giroux, 1997). Understanding whiteness is a critical step in addressing the issues of racial inequality and social justice, as it recognizes the unearned advantages and privileges that come with being categorized as white. Whiteness exists around us through the material products designed by dominantly white designers reinforcing societal norms. Many individuals of color can not relate to this phase; I do not have to worry about looking like a “ghost” in my pictures. Photography is not just a system of calibrating light but a technology of whiteness. Photography is not just a system of calibrating light but a technology of whiteness. The racial bias built into photography is still evident in its digital form, where the silicon pixels are not optimized to register dark skin tones. Many coding languages that serve as the foundation for developing digital platforms are also subject to the influence of whiteness. In our discussion, we highlight the fact that products created with a focus on whiteness hold significant power but also cause harm to marginalized communities. It is high time that we recognize and address the influence of whiteness in product design and work toward creating a more inclusive and equitable society.

# POSTER PRESENTATIONS



## AQSHEMS METEN NICHOLS

*PhD Candidate, Civil and Environmental Engineering, University of California, Berkeley*

Obstacles and Opportunities to Improving Transportation Access to Community College Education: A Review of the Education Access Literature

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**BIO:** Aqshems Nichols is a PhD candidate in UC Berkeley's transportation engineering program in which he is co-advised by Professor Susan Shaheen and Professor Joan Walker. His research focuses on investigating more deeply the relationship between transportation access and life outcomes with an emphasis on community college education. Aqshems previously served as a survey researcher with UC Berkeley's Transportation Sustainability Research Center (TSRC). He also has served as a graduate student researcher at the UC-Berkeley Safe Transportation Research and Education Center (SafeTREC).

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**ABSTRACT:** Transportation is a critical factor for students enrolled at institutions of higher learning especially those who do not live near or on campus. Community colleges (CCs) are primarily composed of students who commute to campus, but the literature analyzing transportation issues facing these students is limited. To better understand transportation access barriers to CCs and develop effective strategies for addressing them, a literature review analysis of 61 studies focusing on transportation issues of higher education students was conducted. This included content analysis of research questions concerning the mode choice of college students when commuting to campus and their perceptions of various issues related to transportation from both domestic and international studies conducted from 2008 to 2023. Access modes discussed in the literature included: public transit, personal vehicle, and walking, and barriers ranging from spatial mismatch to physiological factors were also discussed. The STEPS to Transportation Equity Framework, which stands for Spatial – Temporal – Economic – Physiological – Social, was employed as a framework to identify obstacles to and opportunities for improving transportation access to CCs. This paper contributes to the literature by systematically identifying the major themes related to transportation access to higher education, developing preliminary strategy concepts that could be employed to address barriers, and denoting key literature gaps that should be filled to help promote more innovative strategies in alleviating CC transportation access barriers.

# POSTER PRESENTATIONS



## KAPIAMBA KASHALA FABRICE

*PhD Student, College of Engineering,  
University of Miami*

### Characterizing and Mitigating the Health Risks of Secondhand Aerosols from Electronic Nicotine Delivery Systems

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**BIO:** Kapiamba Fabrice is a distinguished scholar known for his groundbreaking research and commitment to community and academic excellence. Kapiamba's extensive contributions to the field are evidenced through his numerous peer-reviewed publications, focusing on areas like heterogeneous catalysis, aerosols, and soft matter colloids. His work addresses critical environmental issues, reflecting his dedication to scholarship and advocacy. Kapiamba has shared his expertise at prestigious conferences, including multiple presentations at the AAAR Annual Conference, demonstrating his leadership in the scientific community. His roles as a Teaching Assistant at the University of Toledo, Missouri University of Science and Technology, and the University of Miami, and his involvement in mentoring activities, highlight his commitment to service and character, fostering a nurturing and inclusive academic environment. His recognition as a NOBCCHE Graduate Rising Star, his induction to the Bouchet Honorary Society, and the recipient of various awards and scholarships attests to his excellence in scholarship and research. Kapiamba's professional experience, including impactful roles at Phoenix Tailings and the Flow Process & Rheology Centre, further underscores his leadership and service in the field of Chemical, Environmental, and Materials Engineering.

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**ABSTRACT:** The rising popularity of Electronic Nicotine Delivery Systems (ENDS) among young Americans has raised significant public health and environmental justice concerns. In 2021, with over 15 million users, the widespread use of devices like e-cigarettes, e-hookahs, and vape pens highlighted critical health risks for adolescents and young adults, alongside concerns for indoor air quality. This dissertation investigates the less understood area of secondhand ENDS aerosols, which not only result from device operation but also from user exhalation, potentially impacting non-users in shared environments. The study aimed to bridge the knowledge gap regarding the physical, chemical, and toxicological characteristics of these aerosols to guide regulatory policies and health recommendations. Initial findings revealed concerning levels of metals such as chromium (Cr) and nickel (Ni) in aerosols from two ENDS brands, which could pose health risks. Aerosol metal content was analyzed using inductively coupled plasma mass spectrometry (ICP-MS), showing significant metal presence. Additionally, the research examined aerosol size distribution and their deposition potential in the respiratory system. The toxic effects of secondhand ENDS aerosols were assessed using in vitro models that simulate human lung exposure. Results indicated substantial cell death in exposure to aerosols across various device power settings and nicotine concentrations, underscoring potential health hazards to bystanders. The study's findings, particularly at higher power settings, highlight the risk of lung damage and disease progression from secondhand aerosol exposure.

## FOUZIA HOSSAIN OYSHI

*PhD Student,*

*Civil and Environmental Engineering, University of California, Berkeley*

### Behind the Scene of “Green Stormwater Infrastructure by and for Communities”

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**ABSTRACT:** Green stormwater infrastructure (GSI) offers a multitude of stormwater, health, social and ecological benefits. However, in underserved areas, GSI often fails to serve its full potential due to lack of acknowledgement of community needs and in-depth contextual challenges in the design process. The project “Green Stormwater Infrastructure by and for Communities” seeks to understand the process of building community insight into GSI design. The project explores community-led GSI design process through a series of community workshops in Richmond and East Oakland, two low-income communities of color in the Bay Area of California, USA. The project is a collaboration between San Francisco Estuary Institute (environmental research institute), San Francisco Estuary Partnership (regional collaboration for water quality), Urban Tilth (CBO\* in Richmond), Hood planning Group (CBO\* in Oakland) and University of California, Berkeley (Academic research institution). It is evident that this collaborative project involves diverse expertise and agendas with unique organizational structures. Research on equitable GSI asks for collaboration between diverse stakeholder groups, however, there is limited research demonstrating the differences and challenges in the collaborative design process. This work represents an ongoing exploration of the preparatory processes for workshops capturing the varying perspectives and approaches among the collaborators. For example, we noticed that, although the CBOs’ are rooted in the spirit of Environmental Justice, they are inclined to design workshops based on their own rich lived experiences rather than adhering to theoretical frameworks. We also noticed that certain approaches to engage communities stand out distinctly between the CBOs’, even within the same project task. While Hood Planning Group is determined to compensate participants for their time, Urban Tilth prioritizes value for participation over monetary rewards. Through this work in progress research, we aim to identify the different process factors associated with diverse perspectives that influence GSI design along with technical considerations. \*Community Based Organization

# BEATRIZ INACIO

*Undergraduate Student,*

*Civil and Environmental Engineering, University of South Florida*

## Using Community Based Research to Advance

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**ABSTRACT:** It is well known that communities of color experience disproportionate exposure to dangerous environmental pollutants, which has a negative impact on their health. The historical practices of discrimination, which have aided in residential racial segregation, can be linked to many of these exposures. While there has been substantial success in the environmental justice movement's incorporation of public health research into these issues, there hasn't been as much focus on the movement's inclusion of environmental engineering education. The NSF-funded research purpose was to implement a comprehensive, interdisciplinary, community-based training program with an anti-racism focus for undergraduate civil and environmental engineering students at the University of South Florida. The goal is to provide students with the tools they need to effectively address environmental justice issues.

In this project, fields of anthropology, environmental engineering, and STEM education are combined to rewrite current civil and environmental engineering curriculum, with an emphasis on promoting fair development in particular communities. At the same, a more comprehensive educational framework is offered to deal with environmental engineering problems, attend to demands indicated by the community, and take structural racism's systemic effects into account. The results of incorporating environmental engineering, anthropology, and justice themes into engineering curricula will be demonstrated in the presentation.



# JOSEPH 'JOEY' VALLE

Sarah Brownell, D. C. Beardmore, Robyn Mae Paul, Kyle Trenshaw

*Post-Doc Scholar, Purdue University*

Inspired by Black “Collective Courage”: A reading group reflects on Jessica Gordon Nembhard’s book

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**BIO:** Dr. Joey Valle is a postdoctoral scholar in the School of Engineering Education at Purdue University. They have been awarded an NSF postdoctoral fellowship to study intersections of labor and engineering.

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**BIO:** Kyle Trenshaw serves as the Assistant Director for STEM Education at the University of Rochester's Learning Center. In his role, he supervises peer leaders in two academic support programs and trains PLTL Workshop Leaders across multiple undergraduate courses. He received his PhD in chemical engineering from the University of Illinois at Urbana-Champaign in 2014 and served as a postdoctoral researcher in STEM education at Brown University until 2017 when he began his present position. His research interests include building a sense of belonging in STEM higher education for students from systemically-marginalized groups, infusing mindfulness into teaching and learning, and creating space for vulnerability and humility in academic and professional environments.

## JOSEPH 'JOEY' VALLE

Sarah Brownell, D. C. Beardmore, Robyn Mae Paul, Kyle Trenshaw

*Post-Doc Scholar, Purdue University*

### Inspired by Black “Collective Courage”: A reading group reflects on Jessica Gordon Nembhard’s book

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**ABSTRACT:** Throughout much of history and continued through contemporary practices, engineering and engineering education in the so-called United States of America have served to imperialistically extend and reinscribe the capitalist mode of production and the other mutually reinforcing oppressive systems. Solidarity economies, as economic activities of meeting material needs through practices of interdependence and collective liberation, offer paths for surviving and transitioning from the devaluation and degradation of life inherent under capitalism. Throughout US history, Black collaborative action – through hundreds of mutual aid societies, insurance programs, credit unions, training schools, and worker cooperatives – developed methodologies, demonstrated success, and kept the dream of non-extractive, supportive communities alive, amidst poverty, discrimination and violent repression. While engineers and engineering educators can play important roles in solidarity economies, even exposure to common solidarity economy tools of cooperatives is severely limited amongst these workers. Far less is presented about the inspirational work of Black cooperative enterprises from which they might learn and find encouragement. Here we offer a report back on an initial educational venture, a study group composed of engineering educators alongside community members, to learn more about cooperatives so as to bring that learning to our communities.

The study group centered around reading *Collective Courage: A History of African American Cooperative Economic Thought and Practice* by Jessica Gordon Nembhard. Gordon Nembhard offers a history of Black cooperative ownership in the US and its connections to collective economic agency, grassroots economic organizing, and broader sociopolitical struggles. She emphasizes the critical importance of education and shared values, particularly highlighting study groups as essential in starting and sustaining cooperatives. We highlight connections between some of the Black cooperative ventures described by Gordon Nembhard and what is traditional engineering work. We also reflect on our experience in the study group, the sense of community and shared purpose that we built, and consider how to transition the knowledge we take with us into the varied engineering and educational spaces we inhabit.

# POSTER PRESENTATIONS



## CARLEY WILLIAMSON

Erin Hughes & Chloe Rastatter

### Solidarity Engineering: Community-driven Humanitarian Aid Work

**BIO:** Carley Williamson is a mechanical engineer working in global water sustainability and lifecycle management. She works as a condition assessment engineer in the water and wastewater industries in the US. Carley has experience in water and sanitation projects abroad in Malawi and Kenya, focusing on water access, quality, and knowledge sharing. She currently volunteers with Solidarity Engineering, protecting the health of those displaced at the U.S.-Mexico border.

**ABSTRACT:** Solidarity Engineering is a women-founded, women-led humanitarian aid organization whose mission is to provide community-driven and public health-focused engineering for people in crisis. Working with displaced populations in low-resource and high-need areas, we focus largely on three categories of work; WASH (water, sanitation, and hygiene) and infrastructure, play and STEAM (science, technology, engineering, art, and mathematics); and data-driven advocacy. As engineers, infrastructure specialists, and technology experts, our approach to these initiatives prioritizes the root causes of public health crises that often compound in humanitarian settings.

# POSTER PRESENTATIONS



## VALERIE BULLOCK

Estenia Ortiz Carabantes, Lafe Eastman, Natasha Sutton,  
Michelle Henderson, & Maya Trotz

*East Tampa*

A vision for building a pipeline from the block into the water and wastewater sector

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**BIO:** Valerie Bullock is a Wastewater Plant Supervisor for the City of Lakeland. She holds licenses as a class A wastewater operator and a class C drinking water operator. With over 25 years in the environmental services industry, Valerie is interested in developing workforce development programs that demystify water treatment and provide pathways to secure jobs in the sector for youth in East Tampa.



## LUPITA MONTOYA

Maya Trotz, Andrea Ferro, & Angela Bielefeldt  
*Community Fellow, DOE*

Strategic Partnership for Alignment of  
Community Engagement in STEM

# POSTER PRESENTATIONS



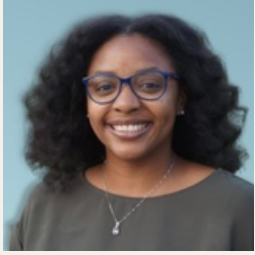
## CYNTHIA MARCELLA ELLIS

Indigenous Garifuna perspectives on sustainability and replenishment living in harmony with Nature.

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**BIO:** Cynthia M. Ellis , the Ambassador-At - Large for the Garifuna Nation and Co-founder of/Chairperson of The GODSMAN CELESTINO ELLIS CENTER FOR GARIFUNA CULTURE(GCE-CFG),I, epitomizes unwavering determination and resilience . Born on January 16, 1953 in August Pine Ridge.Orange Walk District Belize Central America, she radiates inspiration and empowerment. Her Life's purpose centers on Championing Garifuna sovereignty and land rights, both locally and globally. A mother of five and beloved grandmother of 17, Cynthia's commitment to equality and human rights extends beyond her family. Her nurturing spirit serves as a beacon of hope for countless young individuals and women, igniting aspirations and nurturing potential in the realms of sustainability and environmental issues. In her on going pilgrimage, Cynthia has woven a powerful tapestry of unity that transcends boundaries and limitations. Freed not only as a woman but as a visionary, she stands ready to reshape the narrative for generations to come. Guided by the wisdom of her ancestors, she has shed the burdens of trauma and suffering. Today, she stands as a formidable Garifuna Woman, steadfastly answering the call of the ancestors in the -Dabuyaba-(Ancestral House of Worship)-which serves as a testament to her enduring commitment to leave a legacy that will inspire and guide humanity for generations to come.

# POSTER PRESENTATIONS



## BRIANNA CLARK

*PhD Student, School of Education,  
University of California, Berkeley*

**Bossip, Bars, and Jurassic Park**

**BIO:** Brianna Martise Clark, first of her name, is (for the purpose of this bio) a Chemical Engineer turned Learning Sciences researcher, and 3rd-year doctoral student in UC Berkeley School of Education's Learning Sciences cluster. At this stage of her research, she is attuned to the myriad ways in which professional engineering practice - as the corporatized design, development, production, and implementation of various technologies - often serves to reproduce systems of social hierarchy along lines of race, class, and gender. She brings to her work 7 years of full-time experience as a project engineer in chemical manufacturing environments, and a breadth of research and internship experience in various industrial contexts. Her position within the sociocultural domain of the learning sciences is most evident in her methodological approach - wherein she frequently assumes culture and human activity as units of analysis and observation respectively. Meanwhile, her conceptual framings are most closely aligned with scholars of Black feminism, Black geographies, critical race theory, and science & technology studies (STS). Via this orientation, Brianna's work to locate ideological throughlines across undergraduate engineering education and professional engineering practice expands existing notions of the engineering curriculum - which she is keen to interrogate as a site for the proliferation of anti-Blackness.



## J'ANNA-MARE LUE

*PhD Student, Civil and Environmental Engineering,  
University of California, Berkeley*

**Reconstructing Climate Narratives: Small Island Developing States - Former Island Colonies or Climate Vulnerable State?**

**BIO:** J'Anna-Mare Lue (she/her) is a second-year Civil and Environmental Engineering PhD student at the University of California, Berkeley. J'Anna is an interdisciplinary scholar whose research seeks to explore engineering as a potential site for reparative worldbuilding. Her work is largely focused on water and climate change but attempts to engage anti-colonial and decolonial thought, and Black feminism. J'Anna is from a rural fishing village called Manchioneal in Jamaica. She is concerned with Black Geographies, especially the Caribbean.

A photograph of a modern building with large glass windows and a palm tree in the foreground. The building has a facade of vertical glass panels and light-colored panels. The palm tree is on the left side of the frame. The sky is blue with some clouds.

# NOTE OF GRATITUDE

**Thank you so much for attending the 2024 WeRISE Summit! It was a pleasure to host you. We would like to extend the utmost gratitude to the speakers, attendees, and volunteers for making this event a success. This Summit was made possible by the work and support of so many people, including Dr. Joan Walker and Kelly Vernon of the CEE department, A-Neisha Sapp, and Andre Anderson who manage the facilities and AV technologies we needed to make the day a success, and our extensive planning committee listed below:**

- J'Anna-Mare Lue
  - University of California, Berkeley - Civil and Environmental Engineering Department
  - University of California, Berkeley - Civil and Environmental Engineering for Anti-Racism (CEE-FAR)
- Maya Carrasquillo
  - University of California, Berkeley - Civil and Environmental Engineering Department
  - University of California, Berkeley - Community Engaged Education in Civil and Environmental Engineering (CEE)<sup>2</sup>
- Maya Trotz
  - University of South Florida - Civil and Environmental Engineering Department
- Michelle Henderson
  - University of South Florida - Civil and Environmental Engineering Department
- Katherine Alfredo
  - University of South Florida - Civil and Environmental Engineering Department
- Ruthmae Sears
  - University of South Florida - Department of Teaching and Learning
  - University of South Florida - Coalition of Science Literacy
- Christian Wells
  - University of South Florida - Anthropology Department
- Florence Adesope
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- University of South Florida - Educational and Psychological Studies
- University of South Florida - Institute on Black Life Department



# THANK YOU TO OUR MODERATORS!

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A sincere thank you to our moderators that have helped us run Summit sessions smoothly! We greatly appreciate all of your efforts to make this an amazing event!



J'Anna-Mare Lue



Ruthmae Sears



E. Christian Wells



Maya Carrasquillo



Brianna Clark



Michelle Henderson

# THANK YOU TO OUR VENDORS!

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A sincere thank you to the vendors that helped us make this Summit successful today! We greatly appreciate all of your efforts to make this an amazing event!



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