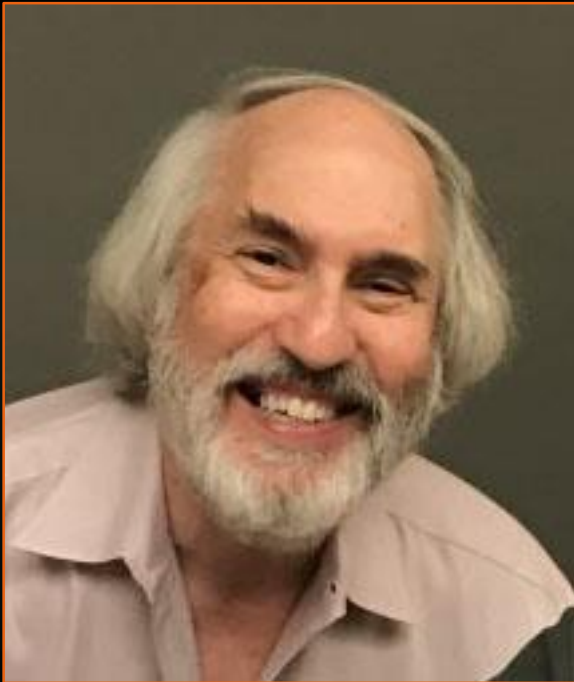


January 12, 2023
Team Project Pitch Day



ENGR110/210

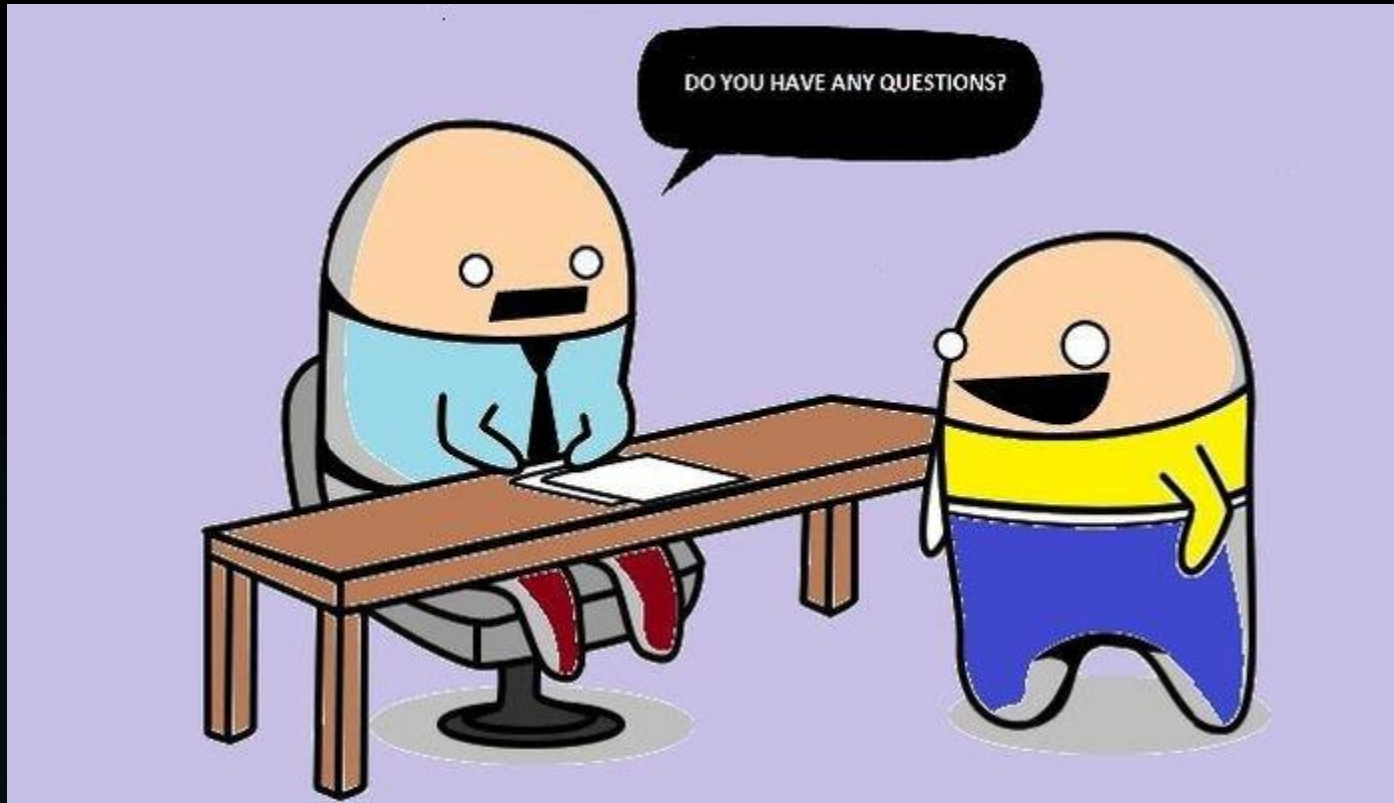
Perspectives in Assistive Technology



David L. Jaffe, MS
Instructor

17
Years

Do You Have Any Questions?



Thanks to:

- ▶ Students:
 - ▶ Enrolling and participating in the course
 - ▶ Filling out lecture evaluations and comments
- ▶ Haas Center for Public Service:
 - ▶ Funding
- ▶ Community Members:
 - ▶ Participating and “adding to the conversation”
- ▶ Project Suggestors:
 - ▶ Suggesting great projects
 - ▶ Working with students



Suggestor

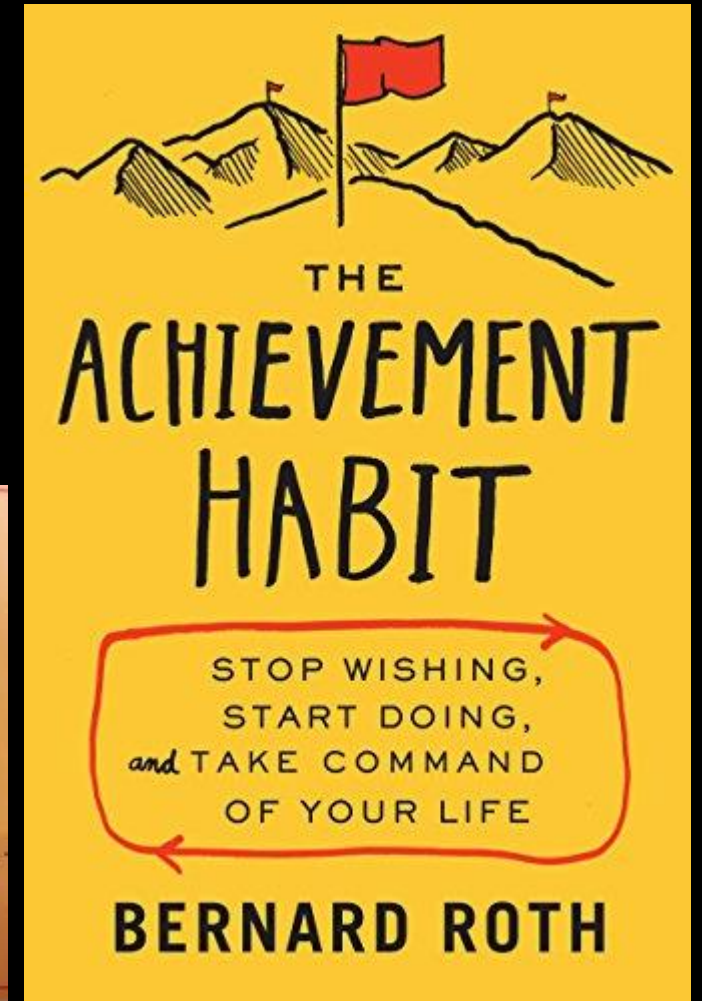


actor, adjudicator, adjustor, advisor, alienator,
animator, aviator, capacitor, competitor,
consolidator, creator, defector, dictator, director,
discriminator, doctor, eliminator, estimator,
evaluator, fabricator, facilitator, innovator,
instructor, interrogator, investigator, liberator,
navigator, orator, perpetrator, predecessor,
predictor, procrastinator, proctor, professor,
renovator, resistor, sponsor, **suggestor**, suitor,
supervisor, tailor, traitor, visitor

Missing a required class session



1. Let me know (beforehand, if possible) by email
2. Do not provide a reason
3. Make up the missed class session promptly



Enrolled Student Attendance Sheet



- ▶ All enrolled and auditing students: Please fill out pink Attendance Sheet in every class session to verify your presence.

01a ENGR110/210 Enrolled Student Attendance List
January 10, 2023

Students listed in Italics are enrolled for 1 credit unit

Email address @stanford.edu	Name of Enrolled Student	Email address @stanford.edu	Name of Enrolled Student
	Adebayo, Scia		Miller, Barrett Andrew
	Aydin, Beate		Mossamer, Nicole Elise
	Barnard, Nathaniel Alan		Murphy, Matt
	Black, Lucy Victoria		Namba, Ayumi
	Cazares, Isaac Anthony		Opferman, S G
	Chang, Athena		Palmer, Jesmin Elena
	Chang, Chih-Ling		Quiroz, Jessica Citalli
	Conrull, Saksham		Rainco Sacoto, Omar Enrique
	Contreras-Forswet, Ezekiel Earl		Radio, Darren Troy
	Diaz, Carlos		Rieken, Merissa Bryn
	Flecher, Rodolfo Henrique		Robinson, Kameron Jarod
	Francis, Charle Chelsea Alanna		Schroeder, Olivia Cyan
	Gabriel, Ari		Seybold, Maddy Marguerite
	Garsa, Aaron		Singh, Rishi Kapoor
	Giil-Silva, Josue		Somarebne, Griffin Deniel
	Heng, Kimberly Ann		Sosa, Sophia
	Higgins, Elijah		Tena-Meza, Stephanie
	Hsu, Evan N		Thienngany, Shaleen R
	Huang, Catherine		Toyozaki, Dominique
	Huang, Ethan		Tran, Ayumi
	Jia, Rebecca Ran		Varuvet Dennison, Deepak
	Johnston, Corazon A.		Viruet Quintero, Olivia Felice
	Joehi, Pranti Satish		Wang, Yu Han Daisy
	Kalandarova, Koli		Williams, Samantha Magdalena
	Karla, Luciana Sonia		Wona, Emily
	Kern, Kelly Mackenzie		Zhang, Grace
	Kohga, Maho		Zhao, Luke Yuchen
	Kwon, Andrea		Students on Wait List
	Lescair, Sasha Roland Abraham		Linhares-Huang, Cameron Ines Ohara
	Li, Kaila		O'Malley, Seamus Patrick
	Lim, Ian		Sandawal, Breanna
	Liu, Angela J		Alex, Sommer
	Liu, Janet		
	Lopez, Fatima Guadalupe		
	Macedo, Hicami		
	Mathews, Quinn Jack		

If your name doesn't appear on this page, enter it on the following sheet

Candidate Team Projects



- ▶ For students taking the course for **three credits**: Use Google Form at <http://engr110.Stanford.edu/01b>
- ▶ As each project is pitched, review its project description on the course website
- ▶ Take notes to help you determine your interest priority.
- ▶ At the end of all presentations, review your notes and select your top five project preferences.
- ▶ Speak to the Project Suggestors for more information.
- ▶ **Don't forget to submit the form today.**
- ▶ I will compile all project choices on the course website to facilitate project selection and team formation

Tuesday, January 17th



Creating Assistive Technologies -
Understanding the Problem

Gayle Curtis - UX Design Consultant

Leftovers from Tuesday

- ▶ Persistent vegetative state - loss of higher brain functions, now called **unresponsive wakefulness syndrome**



Terry Schiavo

- ▶ Moses' disability: In a test of baby Moses' capability to destroy Pharaoh's kingdom, angel Gabriel guided Moses' hand to pick up live coal and put in his mouth. This burned his tongue, causing him difficulty in speaking, but saved his life.



Leftovers from Tuesday

- ▶ “Assistive Tech”
- ▶ “Wheelchair Bound”
- ▶ “Disabling Situation” - “Situational Disability”



Today's Agenda



1. Introduction of Course Resource People
2. Overview of PRL and Room 36 Resources
3. Considerations for Project Selection
4. Brief break
5. Project Pitches
6. Open time with Project Suggestors

Course Resource People

- ▶ Deborah E. Kenney, MS, OTR/L
- ▶ Douglas F. Schwandt, MS





Rachel Wallstrom

PRL Course Assistant &
Former ENGR110 Student

Five Minute Overview of PRL & Room 36 Resources



The Stanford **Product Realization Lab** (PRL) is a multi-site teaching facility where Stanford students discover the power to create the future. Established as the Student Shops when the university opened its doors, the PRL has been at the heart of Stanford's pragmatic, results-driven curriculum for more than 125 years. Each year, under the mentorship of PRL faculty and course assistants, more than 1000 Stanford undergraduate, graduate, and professional school students make things of lasting value - innovative medical, food production, transportation, communications, and consumer products - that transform lives at home and abroad.

Stanford Product Realization Lab **Course Assistants** are chosen through a highly competitive selection process. They come from a broad array of academic fields and professional experience. All are committed to helping Product Realization Lab students achieve successful product realization through successive prototyping and rigorous experimentation with processes and materials.



STANFORD PRODUCT **REALIZATION** LAB

- ▶ Design and Manufacturing
- ▶ Open to any current Stanford student
- ▶ Any project*, personal or class-related
- ▶ Tools and Workspace
- ▶ Training, Advice, and Inspiration from our talented and knowledgeable faculty, staff, course assistants, and user community





STANFORD
PRODUCT
REALIZATION
LAB

Leadership Team



PRL Course Assistants



JORDAN QUAD

PARKING STRUCTURE 2
P

VIA ORTEGA

PANAMA ST

ROOM 36
IN JEN-HSUN HUANG ENGINEERING CENTER

LOMITA MALL

MAIN QUAD

LASUEN MALL

OFFICES/ CLASSROOMS
IN BLDG 550

MEMORIAL CHURCH

PANAMA WY

MAIN LAB
IN BLDG 610

DUENA ST

OLD UNION

STANFORD BOOKSTORE

SANTA TERESA ST

SAMUEL MORRIS WY

TRESSIDER UNION

LANE A

STANFORD PRODUCT REALIZATION LAB

LOMITA DR

LAGUNITA DR

P

MAYFIELD AVE





ROOM 36

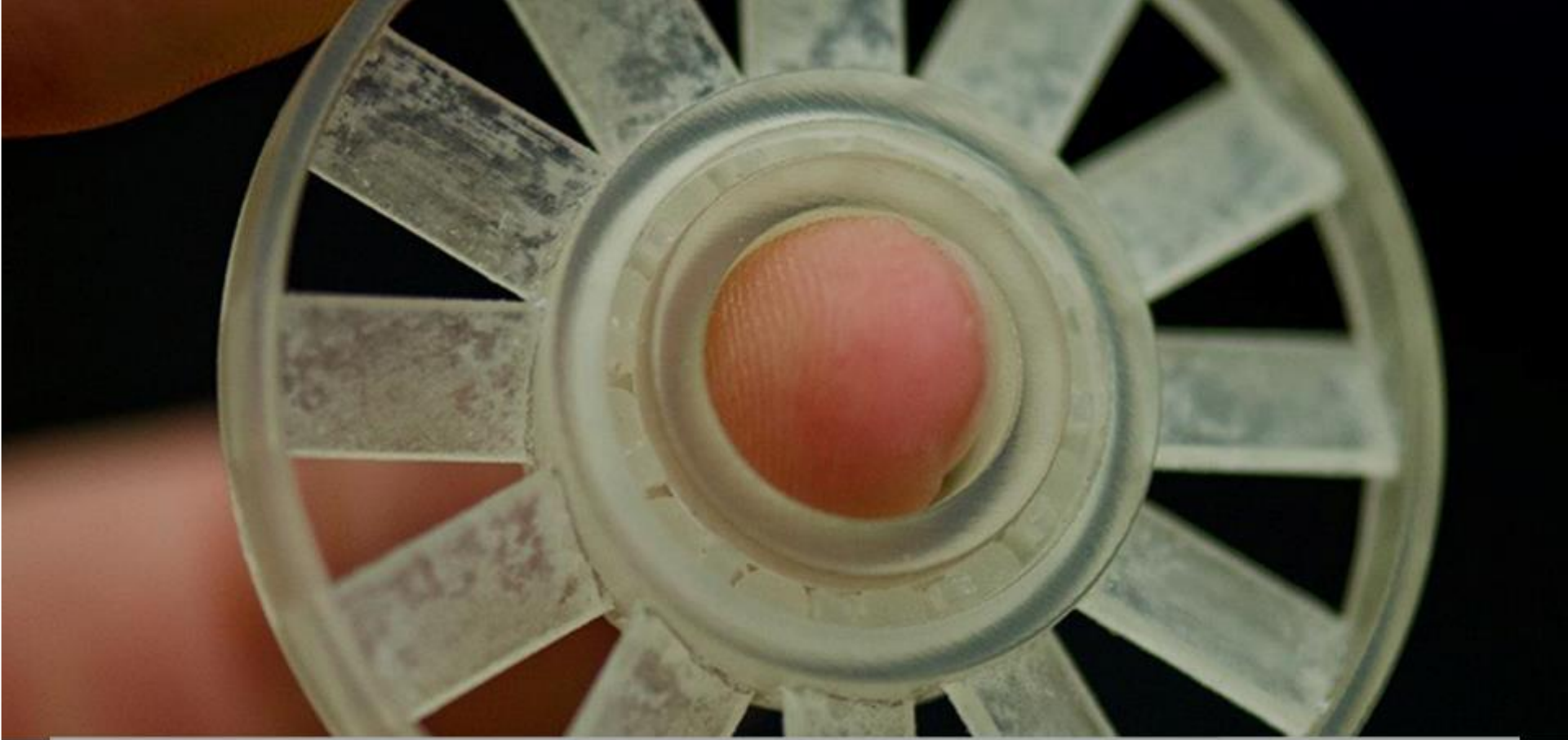
RAPID PROTOTYPING

- ▶ Make Something!
- ▶ Build, Test, and Communicate your ideas... quickly
- ▶ No experience necessary
- ▶ Think with your hands
- ▶ Have Fun!





LASER CUTTING



ADDITIVE MANUFACTURING



3D SCANNING



VINYL CUTTING



FOAM CUTTING



SEWING



ELECTRONICS



MATERIALS

MAIN SHOP (BLDG 610)





MACHINING



CASTING



WOODWORKING



WELDING





ADVICE

HOW TO GET STARTED

- ▶ Visit Webshop <https://webshop.stanford.edu> Follow link
- ▶ Create a login profile with your student ID number
- ▶ Sign up for a safety orientation (roughly 75 min)
- ▶ There is no Shop Fee!
- ▶ That's it! Then come in and use the PRL!





SEE YOU SOON!

<https://productrealization.stanford.edu>

[Follow link](#)

Team Project Selection



For those working on a Team Project:

- ▶ Bring up Google Form:
<http://enr110.Stanford.edu/01b>
- ▶ Read team project descriptions on course website
- ▶ Fill out Project Preferences Form during pitches
- ▶ Talk to Project Suggestors after the pitches

Project Preferences for Students Working on a Team Project

Form description

This form is automatically collecting emails for Stanford University users. [Change settings](#)

Name *

Short answer text

Short Description - Provide a short description to aid in team formation including previous student project experience; skill & expertise in fabrication, presentation, and report writing; available time in quarter (workload); and passion for working to benefit people with disabilities and older adults.

Long answer text

Considerations for Team Project Selection



Course load

- ▶ Students average 5 hours/week on their project in this course.
- ▶ Can you spend the time working on a project? Courses like ME103, ME170, ME203, ME210, ME218, ME310, and BioE141 are very demanding.
- ▶ Are you a TA or CA?
- ▶ Do you have athletic practices?

Fabrication skills

- ▶ Have you built anything before?

Project Preferences



- ▶ Email Dave with selected project, team members, project name (optional) by **Tuesday, January 17th**
- ▶ First to email gets the project
- ▶ Prepare to “hit the ground running” by:
 - ▶ Connecting with your Project Suggestor



Why you may want to



If you have enrolled for **three units**, you may want to consider taking the course for **one unit** or **waiting until next year** if:

1. You are **not graduating**, or
2. If you have limited fabrication experience, or
3. If you are already taking a project course like ME112, ME170, ME203, ME210, ME218, ME310, BioE141, or ...
4. If you have to miss lectures or field trips, or
5. You are unable to devote **5 hours per week** to your project.

Take it twice!



Team Project Selection

For those working on 3 credit unit Team Projects:

- ▶ Pursue project pitched by Suggestor
- ▶ Meet with Dave for suggestions and approval
- ▶ Weekly Progress Reports



Individual Project Selection

For those working on 1 credit unit Individual Projects:

- ▶ Research an assistive technology topic
- ▶ Work on a CAD design of an assistive technology device
- ▶ Fabricate a functional prototype
- ▶ Build an appearance model
- ▶ Create a work of art
- ▶ Engage in an aftermarket aesthetic design
- ▶ Engage in an aftermarket functionality / usability design
- ▶ Optionally pair with another student for Understanding the Problem and Brainstorming
- ▶ Meet with Dave for suggestions and approval



Short Break



- ▶ Fill out Class Session Attendance Sheet
- ▶ Fill out your online Enrolled Student Signup Form if you haven't done so already



01a ENGR110/210 Enrolled Student Attendance List
January 10, 2023

Students listed in *italics> are enrolled for 1 credit unit*

Email address @stanford.edu	Name of Enrolled Student	Email address @stanford.edu	Name of Enrolled Student
	Adebayo, Solin		Miller, Barrett Andrew
	Aydin, Beste		Mosesmer, Nicole Elise
	Barnwell, Nathaniel Alan		Murphy, Matt
	Black, Lucy Victoria		Namha, Ayumi
	Casares, Isaac Anthony		Opferman, S G
	Chang, Athena		Palmar, Jaemin Elena
	Chang, Chih-Ling		Quiroz, Jessica Ciferri
	Conrad, Saksham		Ramoa Escoto, Omar Enrique
	Contreras-Fornest, Ezekiel Earl		Redie, Darren Troy
	Diaz, Carlos		Rieken, Verissa Bryn
	Fischer, Roberto Henrique		Robinson, Kamron Jared
	Francis, Cherif Chalea Alanna		Schroeder, Olivia Cyan
	Gabriel, Ari		Seybold, Maddy Marguerite
	Garza, Aaron		Singh, Rishi Kapoor
	Girolitta, Isaac		Somarenes, Griffin Daniel
	Hang, Kimberly Ann		Sosa, Sophia
	Higgins, Elijah		Tena-Meza, Stephanie
	Hsu, Ewan W		Thangiraman, Shalene R
	Huang, Catherine		Torozaki, Comique
	Huang, Ethan		Tran, Ayumi
	Jia, Rebecca Ren		Vanveel-Dennison, Deepak
	Johanson, Corrado A.		Vincent Quintano, Chris Felice
	Joehi, Pranti Satish		Wang, Yu Han Daley
	Kalanderova, Kobi		Williams, Samantha Magdalena
	Karita, Justina Sonia		Wong, Emily
	Kern, Kelly Mackenzie		Zhang, Grace
	Kehga, Maho		Zhao, Luke Yuchan
	Kwon, Andrea		
	Laaser, Sasha Roland Abraham		
	Li, Kaiti		
	Lim, Ian		
	Liu, Angella J		
	Liu, Janet		
	Lopez, Fatima Guadalupe		
	Maeda, Harumi		
	Mathews, Quinn Jack		

If your name doesn't appear on this page, enter it on the following sheet

2023 Enrolled Student Signup Sheet

This form solicits basic student information, poses a few questions about your reasons for enrolling in the course, and asks you to consider course features and learning objectives that you think would contribute to an excellent course experience. In addition, you are asked to provide your size for a "Stanford Assistive Technology" t-shirt.

dijaffe@stanford.edu (not shared) [Switch account](#)

* Required

Name *

Your answer

Email Address

Your answer

Online Project Preferences Google For



<http://enr110.stanford.edu/01b>

Project Preferences for Students Working on a Team Project

Form description

This form is automatically collecting emails for Stanford University users. [Change settings](#)

Name *

Short answer text

Short Description - Provide a short description to aid in team formation including previous student project experience; skill & expertise in fabrication, presentation, and report writing; available time in quarter (workload); and passion for working to benefit people with disabilities and older adults.

Long answer text

Perspectives in Assistive Technology - Winter 2023
Project Preferences for Students Working on Team Projects (3 credit units)

Student name: _____

As each project is pitched, indicate your general interest in one of the first three columns with a ✓ or ✗. At the end of the all the presentations, select your top five project preferences in the fourth column - optionally providing an ordinal (1st, 2nd, 3rd, 4th, 5th) ranking.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Indicate Top Five	Project Name
				1. Communication Aid for Nathan - Abby
				2. Alert Project - Abby
				3. Rain Shield Project - Abby
				4. Mobile Laptop and iPad Computer Support - Abby
				5. Accessible Storage Solution - Abby
				6. Leash Project - Abby
				7. Bass Reduction Project - Cat
				8. Aesthetic Prosthetic Leg Project - Mary
				9. Projects at the Magical Bridge Playground - Olenka
				10. Water Bowl for Danny's Service Dog Korey - Danny
				11. Leash Project for Danny & Korey - Danny
				12. iPhone Project - Danny
				13. Laptray Project - Danny
				14. Designing Your Afterlife - Dave
				15. Creative Expression - Dave
				16. Student-defined team projects - See Dave for approval

Projects Pitched by Suggestor



- ▶ Projects with **Abby**:
 - ▶ Communication Aid for Nathan
 - ▶ Alert Project
 - ▶ Rain Shield Project
 - ▶ Mobile Laptop and iPad Computer Support
 - ▶ Accessible Storage Solution
 - ▶ Leash Project

- ▶ Project with **Cat**:
 - ▶ Bass Reduction Project

Team Projects Pitched by Suggestor



- ▶ Project with **Mary**:
 - ▶ Aesthetic Prosthetic Project

- ▶ Projects with **Olenka** at the Magical Bridge Playground:
 - ▶ Accessible & Inclusive Playground Attractions

Team Projects Pitched by Suggestor



- ▶ Projects with **Danny, Kiara, and Stanford:**
 - ▶ Water Bowl for Danny's Service Dog Korey
 - ▶ Leash Project for Danny & Korey
 - ▶ iPhone Project
 - ▶ Laptray Project

Projects Suggested by Dave



- ▶ Creative Expression
- ▶ Designing Your Afterlife
- ▶ Student-defined Projects

Projects with Abby

- ▶ “I am mobility impaired, 4'11" tall, and only able to lift 10 pounds. I am very active in advocacy and social justice issues, especially focusing on individuals with disabilities. I speak at national conventions for many organizations.”
- ▶ Challenges to address:
 - ▶ Communication Aid for Nathan
 - ▶ Alert Project for Abby
 - ▶ Rain Shield Project
 - ▶ Mobile Laptop & iPad Computer Support
 - ▶ Accessible Storage Project
 - ▶ Leash Project



On deck: Cat



[Play video](#)

Communication Aid for Nathan



- ▶ Explore designs for a device that would "speak for Nathan", informing people that he is "on the job" and not available to be petted or engage in human-canine conversation.



[Play video](#)

Alert Project for Abby



Explore designs to alert people in Abby's path.



[Play video](#)

Rain Shield Project



- ▶ Explore designs for a suitable covering (a garment or wheelchair / scooter accessory) to protect Abby and her mobility device.



[Play video](#)

Mobile Laptray & iPad Computer Support



- ▶ Explore solutions that would enable Abby to securely and comfortably use her computer devices while away from a desk.



[Play video](#)

Accessible Storage Solution



- ▶ Explore designs for a wheelchair accessible storage solution.



[Play video](#)

Leash Project for Abby & Nathan



- ▶ Explore ways to make it easier for Abby to operate her wheelchair and control Nathan.



[Play video](#)

Project with Cat



- ▶ Explore designs that would enable Cat to enjoy concerts more.

On deck: Mary



Pitch: Vibration Shin Guard

CAT SANCHEZ

JAN 2023

Introduction



- Cat Sanchez (she/her/hers)
- Assistant Dean of Students, Office of Community Standards
- Former transfer student; BA in HumBio, MA in Sociology





Project's Purpose

- Target population: people with nerve damage who want to attend concerts
- I have nerve damage in right shin
- Highly sensitive to vibrations (e.g., running, sound)
- My girlfriend LOVES concerts, but... bass in music makes my leg HURT :(

Please help!



Design Criteria

- Reduces pain from bass directed at leg
- Portable
- Unobtrusive
- Wearable (comfortably)
- Allowed into a concert venue
 - Not mistakeable for contraband item!



Helpful Skills for Project

- Knowledge of or interest in...
 - Acoustic engineering
 - Wearable technology

Help I Can Provide

- I will show up for as many test runs as necessary and provide moral support :)

Thank you!



Project with Mary



- ▶ Explore cool prosthetic leg cover designs for Mary.

Projects with Olenka at Magical Bridge Playground(s)



Accessible? Inclusive? ADA-Complaint?

Let's Reimagine Playgrounds to Include ALL

Beyond "Accessible," There is **Magic!**

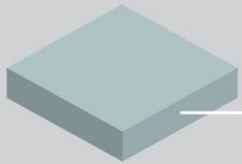
- ▶ Create new play and educational experiences for all ages and all abilities.
- ▶ Incorporate design needs of all playground users and visitors, especially those with visual impairments, sensory issues and diminished fine motor skills.



On deck: Danny, Kiara, Stanford, and Korey

The Discovery:

**ADA
(10%)**



**Overlooked in Playground
Design (90%)**

Autism Spectrum Disorder

Physical Impairments

Visual/Auditory Impairments

Sensory Impairments

Cognitive Disabilities

Older Adults

Medically Fragile

Wheelchair Users



A Magical Bridge Playground Means:

ALL Ages

ALL Abilities

ALL Welcome!



TYPICAL PLAYGROUND



Loose Surfaces
Not Accessible
+ Unsafe for
Breathing
Impairments

**Uneven
Platforms**

“Rat Maze”

No Group Play
Space Limited to
Individual Play

Defined Paths
Little Play Value

No Shade
No Escaping
Frenetic Pace

Raised Borders
Not Accessible

Disorder
Dense and
Overwhelming

**No Retreat
Spaces**

One Challenge Level
One Age Level

No Gates

ADA “Accessibility” Just Isn’t Enough



- ▶ Not a single public playground has been designed with everyone’s unique play needs in mind.
- ▶ ADA standards do not meet the needs of many living with a disability.
- ▶ 1 in every 4 live with a visible or invisible disability, public spaces must serve all.

Magical Bridge Playground, Palo Alto (Flagship)



“Nation’s most innovative inclusive playground.”

7 Unique Zones: Playhouse & Tree Deck, Slide Mound, Spinning Zone, Picnic & Performance Area, Swinging & Swaying Zone, Music Zone, and Tot Play Zone



Playground features are a mix of custom designed equipment and off-the-shelf technology often applied in unique ways.

Global interest brings 25,000 visitors a month here!



Additional Magical Bridge Custom Playgrounds Now Open:

Addison Elementary School, Palo Alto
Red Morton, Redwood City
CuriOdyssey Zoo and Museum, San Mateo
Fair Oaks, Sunnyvale
Community Center, Morgan Hill

Other Local Projects Underway:

Mountain View
Santa Clara
El Carmelo Elementary School, Palo Alto
Cesar Chavez Ravenswood Middle School, East Palo Alto
Bell Street Park, East Palo Alto
Hamilton, New Zealand
Singapore National Museum and NParks in Singapore

Be Part of the Magic and Let's Reimagining Play!



Olenka Villarreal
olenka@magicalbridge.org

www.magicalbridge.org

Projects with Danny, Kiara, Stanford & Korey



- ▶ Water Bowl for Danny's Service Dog Korey
- ▶ Leash Project for Danny & Korey
- ▶ iPhone Project
- ▶ Laptray Project



On deck: Dave



Water Bowl for Danny's Service Dog Korey



- ▶ Explore designs that would enable Danny to independently care for Korey's hydration needs.



Leash Project for Danny & Korey



- ▶ Explore ways to make it easier for Danny to operate his wheelchair and control Korey.

iPhone Project

- ▶ Explore designs that would enable Danny to independently use his iPhone.



Laptray for Danny



- ▶ Explore ways for Danny to easily access and store his personal items on his wheelchair and retrieve them when they fall to the floor.



Smile and the World Will Smile Back

Dave's Suggested Projects



- ▶ Designing Your Afterlife
- ▶ Creative Expression
- ▶ Student-Defined Team Projects

Designing Your Afterlife



- ▶ **Designing Your Afterlife** - Dave

- ▶ Explore ways to preserve one's essence after death. In the technology extreme, this might manifest itself as an interactive system that responds to queries, retells stories, relates experiences, shares expertise, and expresses humor. The pre-dead user would be able to create and program his / her eternal computer-based persona before her / his demise.



Creative Expression



- ▶ **Creative Expression** - Dave
- ▶ Explore ways to enhance creative expression for people with disabilities. This could include the creation of new activities or fabrication of new tools.



Creative Expression using an Instrumented Wheelchair

- ▶ Explore ways to enhance creative expression for people with disabilities, especially those who use wheelchairs. This could include the creation of new activities or fabrication of new tools.



Student-defined Team Projects



- ▶ **Student-defined Projects** - Dave
- ▶ Interview, observe, and discuss assistive technology problems with an individual with a disability or older adult. Address their desire to participate in one of the following activities by designing an adaptation to an existing device / tool or creating a new, more useful one:
 - ▶ Activities of daily living
 - ▶ Sports and exercise
 - ▶ Leisure activities and hobbies



Open Question Time and Non-Random Access



Who is working on projects?



Leave this Zoom and connect with Suggestors' Zoom to get more information on projects, return here when done

Get more info from project suggestor

Identify others interested in same projects

What are your project preferences?

Rank your top choices

Hand in your Project Preference Sheet!

Have course questions?
Ask Dave

See Dave if you want to work on a project that he suggested