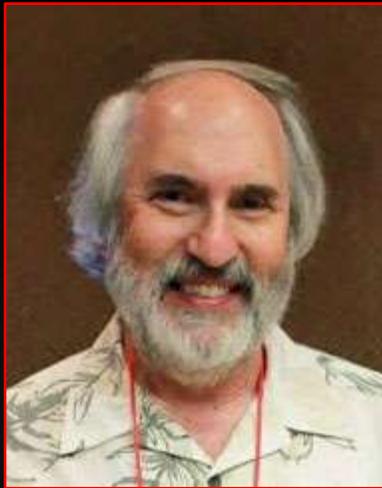


January 10, 2019  
Team Project Pitch Day



# ENGR110/210

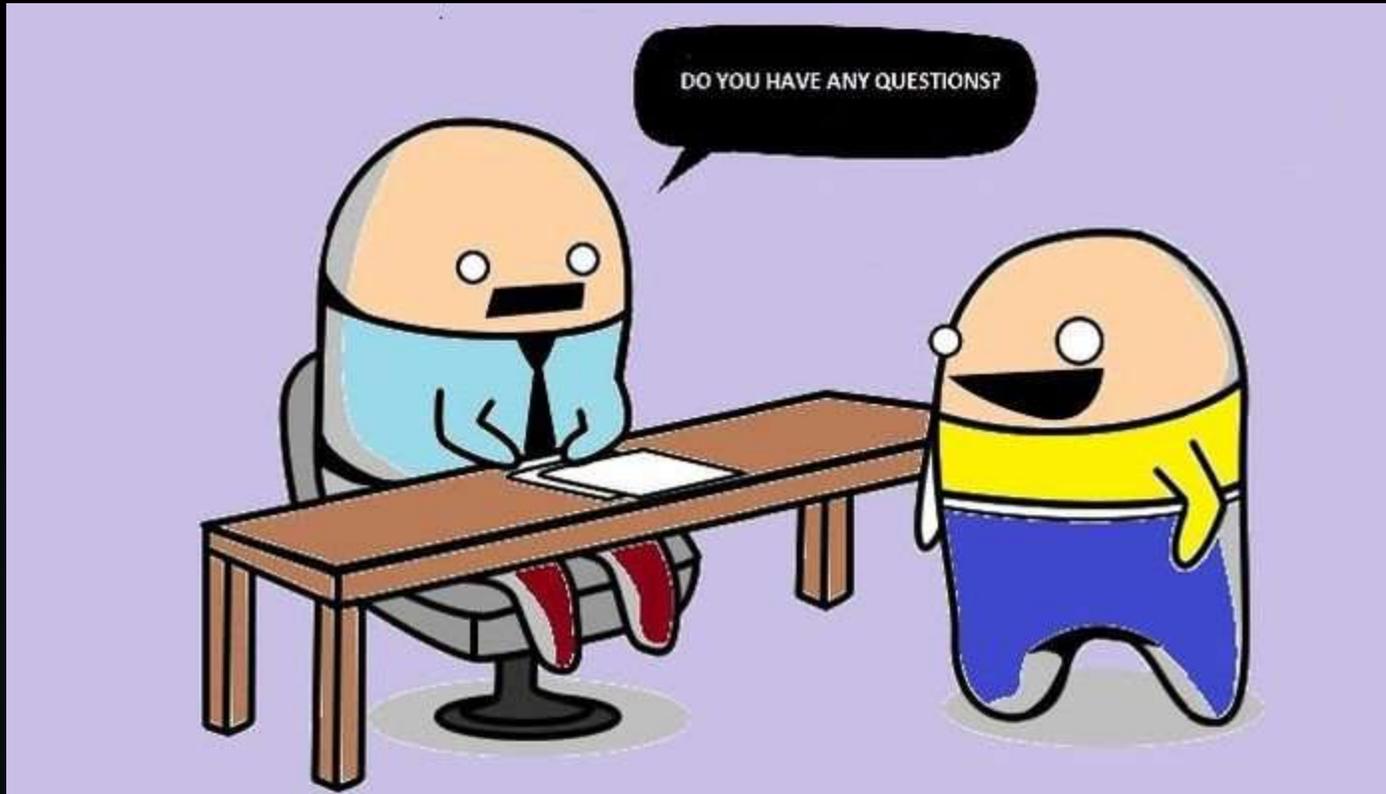
## Perspectives in Assistive Technology



David L. Jaffe, MS  
Instructor

**13**  
**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 teams



# Reminder for Everyone



# Students

If you haven't already done so, please **enroll or drop** ENGR110/210 on Axess.

If you weren't here on Tuesday, pick up your personalized handout packet.

AXESS || MY AXESS STUDENT EMPLOYEE CENTER STARS

STUDENT

Student

Academics

Search  
Enroll  
SimpleEnroll  
My Academics  
Explore Courses  
Explore Degrees  
Study List Planner

other academic...

- Apply to Graduate
- Class Schedule
- Declare a Major/Minor
- Enrollment: Add
- Enrollment: Drop
- Enrollment: Edit
- Exam Schedule
- Grad Student Information
- Grades
- Petitions and Forms
- Request Enroll Certification
- Request Official Transcript
- Search for Classes
- Transcript Request Status
- View Course History
- View Degree Progress Report
- View Program Summary
- View Test & Transfer Credit
- View Unofficial Transcript

Deadlines URL Gradebook

This Week's Schedule

Class	Units Taken	Grading	Schedule
	3.00	Letter (ABCD/NP)	
	3.00	Letter (ABCD/NP)	
	0.00	Non-Graded Component	Room: TBA
	3.00	Satisfactory/No Credit	Room: TBA

weekly schedule ▶

enrollment class picks ▶  
Stanford Bookstore

Account Summary

Current Balance

Currency used is US Dollar.

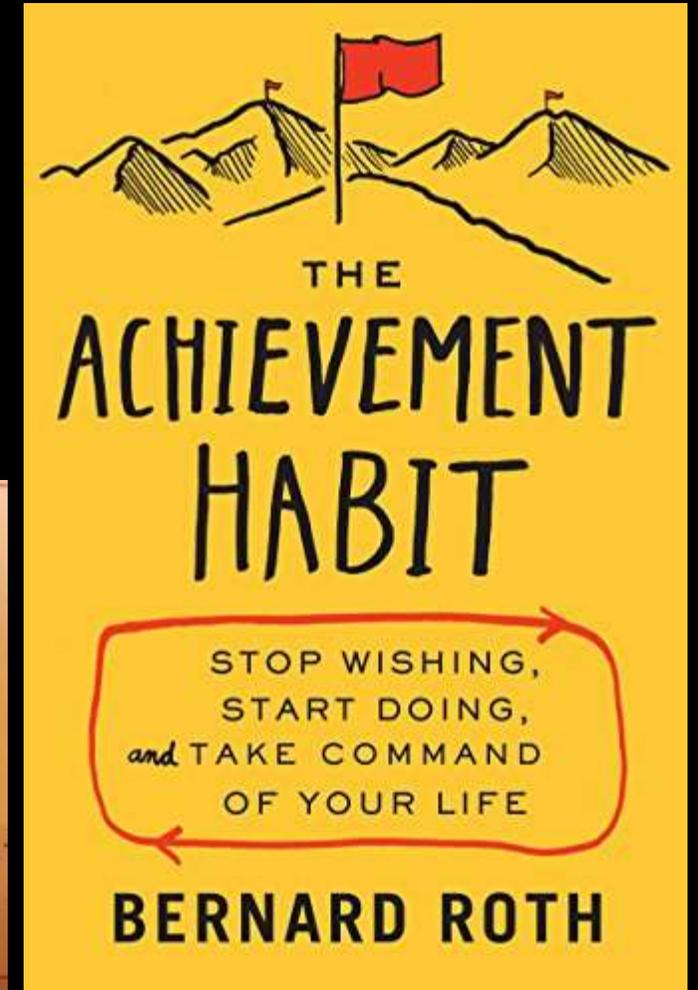
make a payment ▶



# 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





# Candidate Team Projects



## 2019 Candidate Team Projects

- Team projects are for students taking the course for three credit units.

ENGR110/210  
Perspectives in Assistive Technology

David L. Jaffe, MS  
Tuesdays & Thursdays 4:30pm - 5:50pm  
Lathrop Library - Classroom 282

### Contact Information for Teaching Staff & Project Resource People

David L. Jaffe, MS	Course Lecturer	davejaffe@stanford.edu
Deborah Kenney	Occupational Therapist	kenney5@comcast.net
Doug Schwendt	ME Design Consultant	doug.schwendt@gmail.com
Jules Sherman	Designer & Entrepreneur	jules@julesherman.com

Course Website: <http://enr110.stanford.edu>

### Considerations for Team Formation

#### Project preference

All team members should have a strong desire to work on the same project.

#### Team's engineering skill set

The team's expertise and skills should match those required to address the project's challenges.

#### Undergraduate / graduate student

It would be desirable if team members were either all undergraduate or all graduate students as this makes it easier to continue projects into the Spring Quarter.

#### Desire to continue project work into Spring Quarter

If the team desires to continue their project efforts in the Spring Quarter, all team members should be available to participate.

#### Personality

There should be a compatible mix of personalities in the team.

#### Friends and team members

"A good friend does not necessarily make a good team mate." Dave

## Project Pitch Schedule for Thursday, January 10<sup>th</sup>

(Presentation order is subject to last minute changes)

Projects pitched by their suggestors:

1. Projects with Abby
  - o Projects for Abby's Wheelchair (choose 2 of these 3):
    - Enhanced Visibility Project
    - Storage Project
    - Backpack Project
  - o Projects with Abby's Service Dog, Nathan
    - Simultaneous Operation Project
    - Harness Project
2. Projects with June
  - o Clean House Project
  - o Within Reach Project
3. Project with Tony - Lap Extender
4. Project with Fernanda - Easter Whill Recharging
5. Project with Jay at the Magical Bridge Playground
6. Project with Olenka at the Magical Bridge Playground
7. Projects with Angie
  - o Elbow Lifter
  - o Elevator Button Pusher
8. Project with Danny - Laptop for Danny
9. Project with Donna - Donna's Pick Me Up
10. Projects with Amy
  - o Wheelchair Dancing
  - o Creative Expression using an Instrumented Wheelchair
11. Project with Nick - The Hide-Away Lap Tray
12. Project with YA Palo Alto Health Care System's Assistive Technology Lab - Get a Grip Project

Project pitched by Dave:

Dave's suggested projects:

13. Creative Expression
14. Designing Your Afterlife
15. Student-defined Team Projects

Project contacts, photos, and web links - browse to:  
<http://enr110.stanford.edu/team-projects.html>

### Team Formation Preparedness

Since there is no guarantee that other students will have similar project interests, you should be prepared to do one of the following:

1. convince others to work with you on one of your chosen projects
2. consider working with another student on a project he/she has chosen

For students taking the course for three credits.

Web links



# Today's Handout - Project Preferences for Students working on Team Projects



**Perspectives in Assistive Technology - Winter 2019**  
**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 (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>) ranking.

😊	😐	😞	Indicate Top Five	Project Name
				1. <b>Projects with Abby's Wheelchair</b> - Abby Tamara (this project consists of 2 of the following 3 sub-projects) Enhanced Visibility Project Storage Project Backpack Project
				2. <b>Simultaneous Operation Project</b> - Abby Tamara
				3. <b>Harness Project</b> - Abby Tamara
				4. <b>Clean House Project</b> - June Fisher
				5. <b>Within Reach Project</b> - June Fisher
				6. <b>Lap Extender</b> - Tony DeSylva
				7. <b>Easier Whill Recharging</b> – Fernanda Castelo
				8. <b>Magical Bridge Playground Project</b> - Jay Gluckman
				9. <b>Magical Bridge Playground Project</b> - Olenka Villarreal
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				18. <b>Creative Expression</b> - Dave
				19. <b>Designing Your Afterlife</b> - Dave
				20. <b>Student-defined team projects</b> - See Dave for approval



# Tuesday, January 15th



Needfinding and Assistive Technologies

Gayle Curtis - UX Design Consultant



# Leftovers from Tuesday



1. Persistent vegetative state - loss of higher brain functions
2. Course website - <http://enr110.stanford.edu>  
Syllabus  
Lecture Schedule
3. Gender disability
4. Suggestions and observations
5. Bono is almost never seen in public without sunglasses, as he ~~suffers from~~ experiences glaucoma.

"[I have] very sensitive eyes to light. If somebody takes my photograph, I will see the flash for the rest of the day. My right eye swells up. I've a blockage there, so that my eyes go red a lot. So it's part vanity, it's part privacy, and part sensitivity."



Terry Schiavo



# Today's Agenda



1. Introduction of Course Resource People
2. Overview of PRL and Room 36 Resources
3. Brief break
4. Considerations for Team Formation and Project Selection
5. Project Pitches
6. Open Question Time and Non-Random Access



# Course Resource People



- ▶ Matteo Zallio, PhD
- ▶ Deborah E. Kenney, MS, OTR/L



- ▶ Douglas F. Schwandt, MS
- ▶ Jules Sherman



# Five Minute Overview of PRL & Room 36 Resources



- ▶ Elliot Helms - PRL Coaching Assistant and ENGR110 Student Last Year



[Video from last year](#)



036



Student Shop

**INTRODUCTION TO  
ROOM 36**

STANFORD  
PRODUCT  
REALIZATION  
LAB



Elliot Helms

PRL CA

ENGR110 Student Last Year



## 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

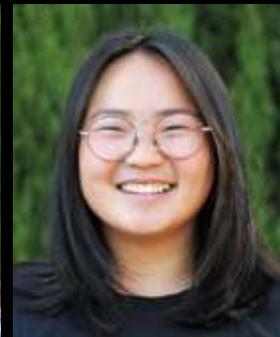




STANFORD  
PRODUCT  
REALIZATION  
LAB

CAs boarded in red have  
taken ENGR110

# Course Assistants



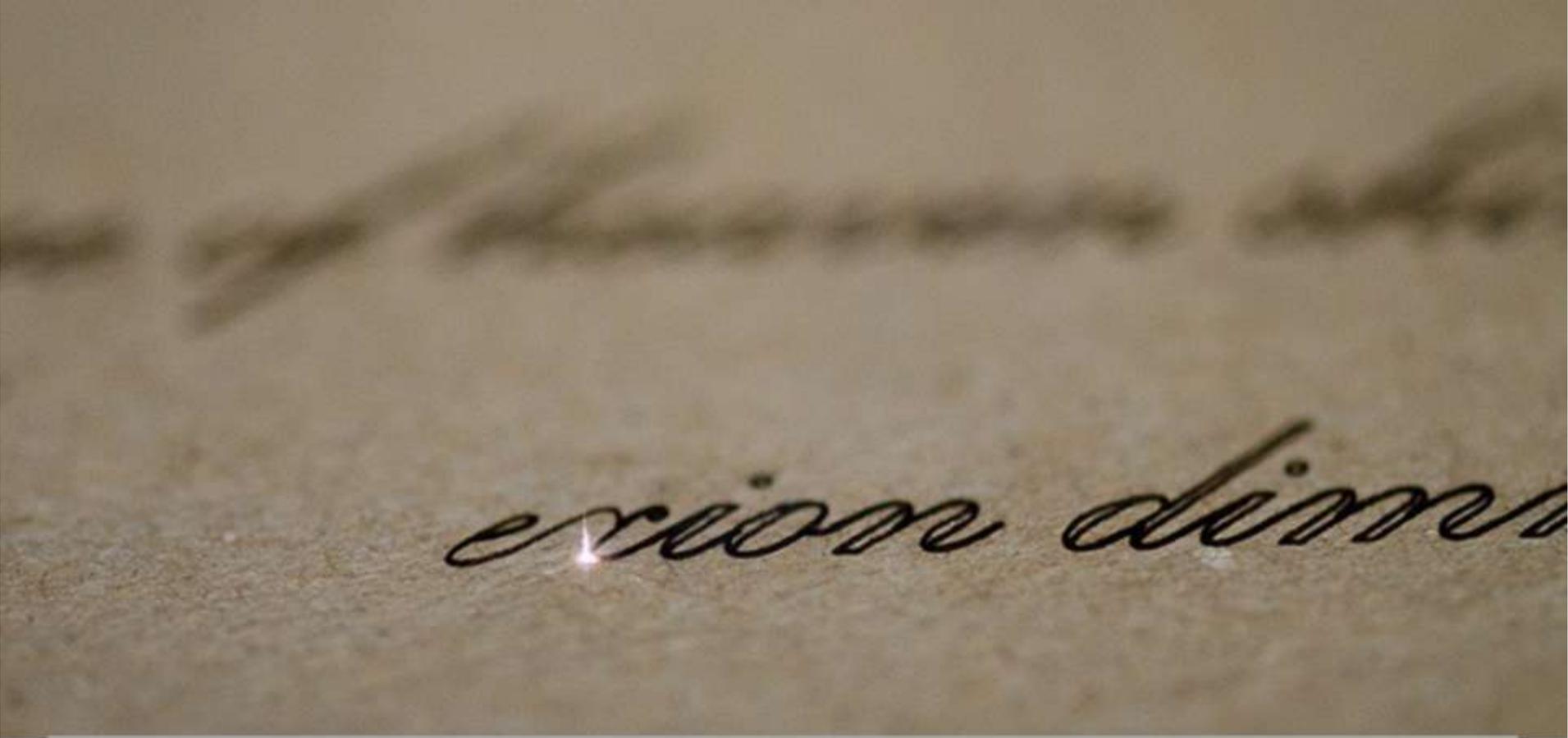


# ROOM 36

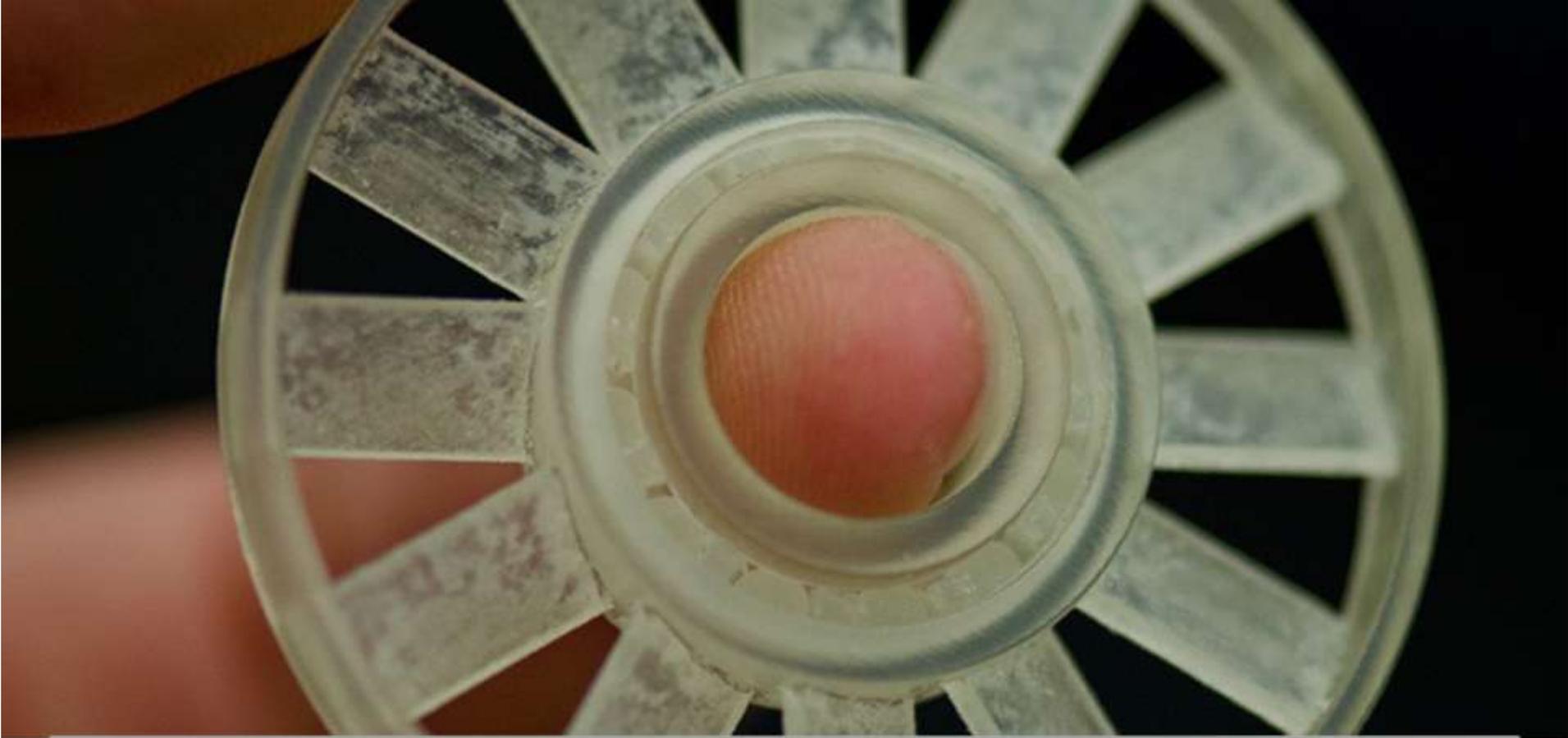
# RAPID PROTOTYPING

- ▶ 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

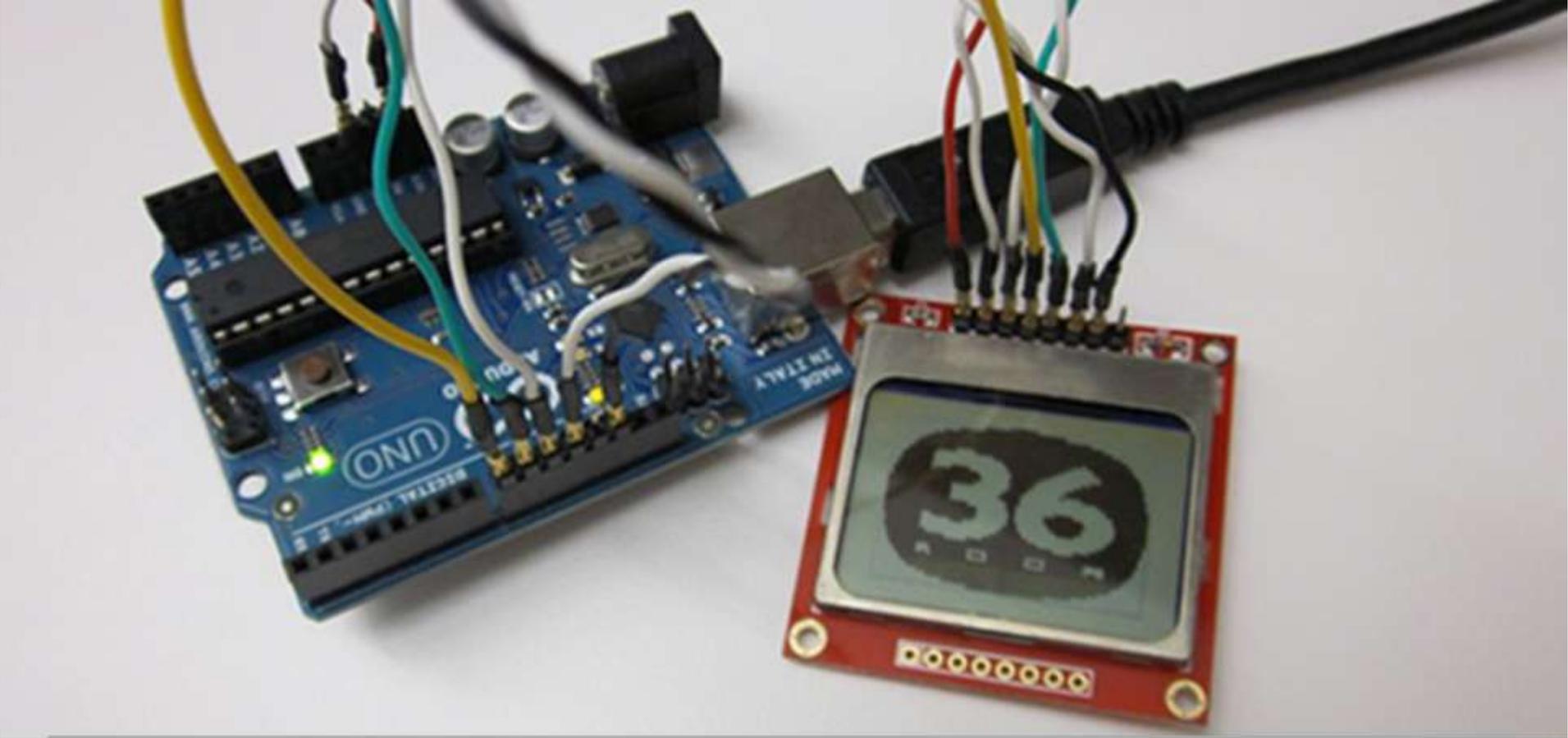


# FOAM CUTTING





**SEWING**



# ELECTRONICS



# MATERIALS





**ADVICE**

JORDAN  
QUAD

PARKING  
STRUCTURE 2



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

STANFORD  
BOOKSTORE

OLD  
UNION

SANTA TERESA ST

SAMUEL MORRIS WY

DUENA ST

TRESSIDER  
UNION

LANE A

# STANFORD PRODUCT REALIZATION LAB

LOMITA DR

LAGUNITA DR



MAYFIELD AVE



## 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)
- ▶ Pay for a lab pass when you show up for the safety orientation (\$60 for 1 quarter, \$80 for 2, \$100 for the academic year)
- ▶ That's it! Then come in and use the PRL!





# SEE YOU SOON!

<https://productrealization.stanford.edu>

[Follow link](https://productrealization.stanford.edu)

# Short Break

- ▶ Pick up your personalized handout packet if you weren't here on Tuesday or have changed your enrollment option
- ▶ Sign Attendance Sheet
- ▶ Sign up to Meet with Dave
- ▶ Hand in your Student Signup Form from Tuesday



# Project Selection & Team Formation



## Project Preference Form for Students Working on Team Projects

For those working on **team** projects:

- ▶ Read project descriptions
- ▶ Fill out Project Preferences Form during pitches
- ▶ Talk to project presenters after the pitches
- ▶ Hand in Project Preferences Form
- ▶ Your preferences will be posted online
  - ▶ <http://engr110.stanford.edu/preferences.html>
- ▶ Inform me of team members (teams of 3 only)
  - ▶ **Students on the Wait List are not eligible**
  - ▶ Name of your team
  - ▶ Name of your selected project
  - ▶ Name your device (after it develops a “character”)

**Perspectives in Assistive Technology - Winter 2019**  
**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 all the presentations, select your top five project preferences in the fourth column - optionally providing an ordinal (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>) ranking.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Indicate Top Five	Project Name
				1. <b>Projects with Abby's Wheelchair</b> - Abby Tamara (this project consists of 2 of the following 3 sub-projects) Enhanced Visibility Project Storage Project Backpack Project
				2. <b>Simultaneous Operation Project</b> - Abby Tamara
				3. <b>Harness Project</b> - Abby Tamara
				4. <b>Clean House Project</b> - June Fisher
				5. <b>Within Reach Project</b> - June Fisher
				6. <b>Lap Extender</b> - Tony DeSylva
				7. <b>Easier Whill Recharging</b> - Fernanda Castelo
				8. <b>Magical Bridge Playground Project</b> - Jay Gluckman
				9. <b>Magical Bridge Playground Project</b> - Olenka Villarreal
				10. <b>Elbow Lifter</b> - Angie Lee
				11. <b>Elevator Button Pusher</b> - Angie Lee
				12. <b>Laptray for Danny</b> - Stanford Stickney
				13. <b>Donna's Pick Me Up</b> - Donna & Jeanne Yeager
				14. <b>Wheelchair Dancing</b> - Amy Li
				15. <b>Creative Expression using an Instrumented Wheelchair</b> - Amy Li
				16. <b>Hide-Away Lap Tray</b> - Nick Zirpolo
				17. <b>Get a Grip Project</b> - Debbie Pitsch
				18. <b>Creative Expression</b> - Dave
				19. <b>Designing Your Afterlife</b> - Dave
				20. <b>Student-defined team projects</b> - See Dave for approval

# Project Selection & Team Formation



Your preferences will be posted online

► <http://enr110.stanford.edu/preferences.html>



ENGR110/210 Student Team Project Preferences - 01/12/2018 - 9:00am																						
Student / Project	Lighter Log Brace	Hybrid Body Powered Harness	Grip Sensor	Abby's Wheelchair	Abby's Service Dog	Clean House	Within Reach	Pack Rat	Wheelchair Caster	Wheelchair Work Tray	Magical Bridge Playground 1	Magical Bridge Playground 2	At Home Monitor	Creative Expression for Danny	Elbow Lifter	Get a Grip	Grade School Lorraine	Creative Expression	Designing Your Afterlife	Student-Defined 1	Student-Defined 2	
Bailey, Jake																						
Barrus, Jacob Harrison																						
Biggar, Aidan James																						
Brenner, Kevin Michael																						
Casas, Alex																						
Dancu, Eric Finlayson																						
Dudley Jr, Brice Edward																						
Eseigbe, Michael Omofuma																						
Garcia, Alejandra																						
Graber, Brian Michael																						
Guerra Arci, Amanda Daniela																						
Hwang, Michelle																						
Kouch, Amy																						
Lai, Anna Wei																						
Little, Mackenzie Patricia																						
Long, Evan Caldwell																						
Modi, Akash Ashok																						
Molina, Oscar Raymundo																						
Nugent, Jean-Marc Simon Baker																						
Petrie, Nathan Lo																						
Pian, Kelsey Lanna																						
Poppe, Heidi Grace																						
Racker, Miniviolet																						
Sanchez, Israel Sanchez Becerra																						
Smith, Michael Lee																						
Taylor, Ben																						
Usevitch, Nathan Scot																						
Wallach von Portheim, Rachael Tamsin																						
Legend:																						
Formed project team																						
Formed project team																						

# Considerations for Team Formation and Project Selection (1 of 2)



## **Project preference**

- ▶ All team members should have a desire to work on the same project.

## **Team's engineering skill set**

- ▶ Match the team's skills and expertise with the project needs. (This depends on the solution chosen.)

## **Spring Quarter student desire and availability to continue project**

- ▶ It would be good if all team members were available to participate in an optional Spring Quarter continuation of their project as Independent Study.

# Considerations for Team Formation and Project Selection (2 of 2)



## Personality

- ▶ There should be a compatible mix of personalities in the team.

## Friends and team members

- ▶ A good friend does not necessarily make a good team mate.

## Course load

- ▶ Can you spend the time working on a team project? Courses like ME203, ME210, ME218, ME310, and BioE141 are very demanding. Are you a TA? Do you have athletic practices?

# Team Project Preferences

- ▶ Email Dave with selected project, team name, and team members by **Friday, January 18<sup>th</sup>**
- ▶ Prepare to “hit the ground running”



# 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, ME203, ME210, ME218, ME310, BioE141, or ...
4. If you have to miss lectures or field trips, or
5. You are on the **Wait List**, or
6. You are not able to devote **4 hours per week** to your project.

Take it  
twice!

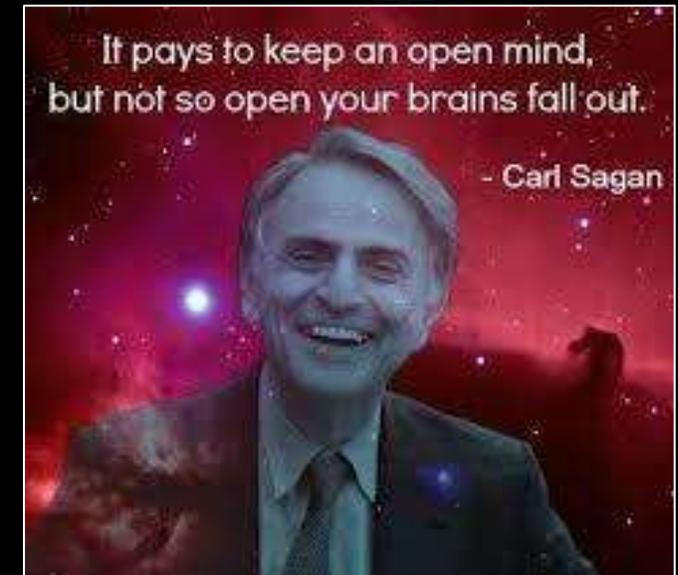


# Team Formation Preparedness



Since there is no guarantee that other students will have similar project interests, you should be prepared to do one of the following:

1. Convince others to work with you on one of your selected projects
2. Consider working with another student on a project he/she has chosen
3. Keep an Open Mind!

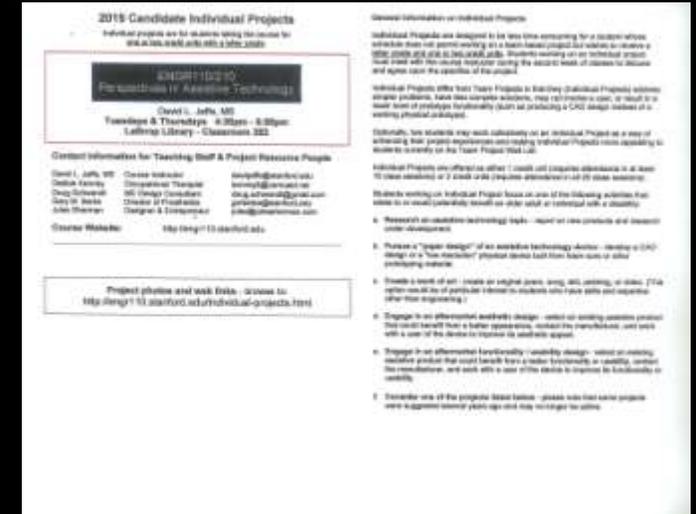


# Project Selection & Team Formation



For those working on **individual** projects:

- ▶ Research an assistive technology topic
- ▶ Work on a paper design of an assistive technology device
- ▶ Create a work of art
- ▶ Engage in an aftermarket aesthetic design
- ▶ Engage in an aftermarket functionality / usability design
- ▶ Pursue a listed individual project
- ▶ Optionally pair with another student (new for 2018)
- ▶ These projects are **not** being pitched
- ▶ Meet with Dave for suggestions and approval



# Team Projects Pitched by Suggestor



- ▶ Projects for Abby's Wheelchair - Abby Tamara
  - ▶ Enhanced Visibility Project
  - ▶ Storage Project
  - ▶ Backpack Project
- ▶ Projects with Abby's Service Dog, Nathan - Abby Tamara
  - ▶ Simultaneous Operation Project
  - ▶ Harness Project
- ▶ Lap Extender - Tony DeSylva (by video)
- ▶ Easier WHILL Recharging - Fernanda Castelo

Work on 2 out  
of these 3  
sub-projects



# Team Projects Pitched by Suggestor



- ▶ Playground Equipment for Students with Learning Disabilities and Challenges in Speech & Language - Jay Gluckman
- ▶ Playground Equipment along the Fence - Olenka Villarreal
- ▶ Elbow Lifter - Angie Lee (by video)
- ▶ Elevator Button Pusher - Angie Lee (by video)
- ▶ Laptray for Danny - Stanford Stickney
- ▶ Donna's Pick Me Up - Donna & JeanneYeager
- ▶ Wheelchair Dancing - Amy Li
- ▶ Creative Expression using an Instrumented Wheelchair - Amy Li
- ▶ Hide-Away Lap Tray - Nick Zirpolo

# Projects Suggested by Others, Pitched by Dave

- ▶ Clean House Project - June Fisher
- ▶ Within Reach Project - June Fisher
- ▶ Get a Grip Project - Debbie Pitsch



# Projects Suggested by Dave



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



On deck: Abby Tamara

# Projects with Abby



- ▶ Projects for Abby's Wheelchair (work on 2 of these 3 sub-projects)
  - ▶ Enhanced Visibility Project
  - ▶ Storage Project
  - ▶ Backpack Project
- ▶ Projects with Abby's Service Dog, Nathan
  - ▶ Simultaneous Operation Project
  - ▶ Harness Project

On deck: Tony by video

# Projects for Abby's Wheelchair



- ▶ **Projects for Abby's Wheelchair** - Abigayil Tamara  
Work on 2 of these 3 sub-projects:
  - ▶ Enhanced Visibility Project - Explore ways to enhance the nighttime visibility of Abby's wheelchair
  - ▶ Storage Project - Explore ways to add a personal secure storage space and facilitate grocery transportation and handling
  - ▶ Backpack Project - Explore solutions for accommodating a backpack (or other storage product) that eliminates sitting against straps

# Projects for Abby's Wheelchair



- ▶ “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.”
- ▶ “I have just acquired a new power chair. It is called a WHILL model M. WHILL is a Japanese company with the US headquarters in San Carlos, CA, about 10 miles from my home. The WHILL is 4 wheel drive, and will operate on most terrains.”
- ▶ Challenges to address: (pick two out of three)
  - ▶ enhanced visibility
  - ▶ storage
  - ▶ backback



# Backpack Project



The **Model M** has a much more integrated and reinforced seat back than the **Model A**. The ergonomic back cushion overlaps the reinforced back support in such a way that doesn't have the same ease of attaching and accommodating a substantial backpack. The only way I have found to attach the backpack is over the back of the seat.

# Backpack Project



The Model M has a different seat configuration that requires that the straps of a backpack be positioned over the seat back.

# Backpack Project



My yellow backpack attaches to the Model M by thick shoulder straps and a small cross strap on the seat back. These straps are painful on my back and defeat the ergonomic features of the chair.

# Backpack Project



I found an alternative backpack that has thinner straps, but is not as well reinforced to carry all my items. It is still uncomfortable on my back and does not provide me with ergonomic seating.



# Backpack Project



I am looking for an attachment solution for a substantial backpack that does not require its straps go over the seat back.

# Projects for Abby's Service Dog, Nathan



- ▶ **Projects with Abby's Service Dog, Nathan** - Abigayil Tamara
  - ▶ Simultaneous Operation Project - Explore ways to make it easier for Abby to operate her wheelchair and control Nathan
  - ▶ Harness Project - Explore ways to make it easier for Abby to put on and take off Nathan's harness

# Projects for Abby's Service Dog, Nathan



“Nathan, my service dog, provides me with balance and support as I hold on to his harness.”

# Projects for Abby's Service Dog, Nathan



**Simultaneous Operation Project** - Explore ways to make it easier for Abby to operate her wheelchair and control Nathan



Flexi Attachment on a Power Wheelchair

# Projects for Abby's Service Dog, Nathan



**Harness Project** - Explore ways to make it easier for Abby to put on and take off Nathan's harness

- ▶ “With my arthritis and grasping difficulties, the buckles that hold the harness on Nathan are difficult for me to work. The buckles attach by pinching one of the parts to fit in the other part. There are two buckles on the front piece, and one under the belly that attaches on the left side.”



# Projects for Abby's Service Dog, Nathan



Detail of Harness Buckles

# Lap Extender

- ▶ **Lap Extender** - Tony DeSylva
- ▶ Explore designs for a wheelchair accessory that will not interfere with propulsion while carrying important items.



0:38 / 1:20

[Video link](#)



On deck: Fernanda Castelo



# Easier WHILL Recharging

- ▶ **Easier WHILLRecharging** - Fernanda Castelo
- ▶ Explore designs to improve Fernanda's WHILL charging experience.



On deck: Jay Gluckman & Olenka Villarreal

# Magical Bridge Playground

## Two Projects

- ▶ Jay Gluckman & Olenka Villarreal
- ▶ Jay - **Playground Equipment for Students with Learning Disabilities and Challenges in Speech & Language** - Explore designs to create new play and educational experiences incorporating multiple senses and actions for all playground users and visitors that could also have positive outcomes for those with learning disabilities and challenges in speech & language.
- ▶ Olenka - **Playground Equipment along the Fence** - Explore designs to create new play and educational experiences along the fence that incorporate multiple senses, actions, and outcomes for all playground users and visitors, especially those with visual impairments and diminished fine motor skills.

On deck: Angie Lee (by video)



# Magical Bridge Playground



Magical Bridge Playground founder, Olenka Villarreal often says, "The playground is a child's first classroom."

Introducing children as early as possible to the variety of people in their community is our best hope for removing social and physical barriers.



# How it Happened



## It all started with a mom, two daughters, and a playground need

Determined to create the kind of outdoor space that both her disabled and non-disabled daughters (and all their friends!) would love, Olenka Villarreal mobilized a team of volunteers to fulfill a dream to create such a place.

## In 2015, Magical Bridge Playground opened to great enthusiasm

Since then, the success of the playground has inspired an awareness that today's parks leave far too many behind.

## With long-time friend and team member, Jill Asher, Olenka created Magical Bridge Foundation as a non-profit organization in 2016

The foundation is beginning to extend its reach beyond the Bay Area and continues to bring the joy of play, kindness and new friendships to as many families as possible.

# 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.

# Magical Bridge Playground, Palo Alto



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

The Playhouse is two stories and the Tree Deck has two bridges including a “rope” bridge. The entire structure is wheelchair accessible.



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

Seven years of research went into this playground design.

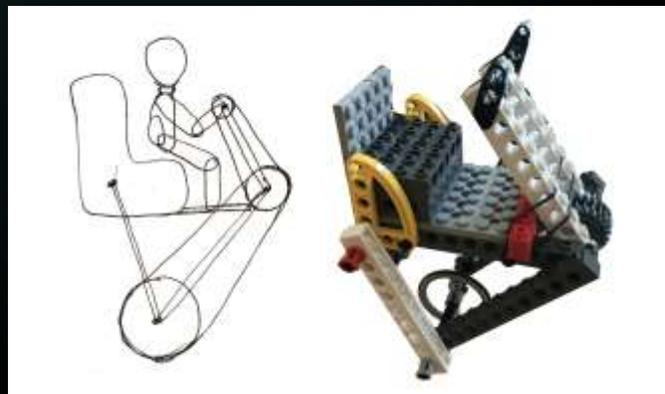


**MAGICAL BRIDGE**  
REDWOOD CITY, CA



- ▶ Construction MAGIC is underway at Red Morton Park in Redwood City! Magical Bridge Playground in Redwood City will welcome and serve visitors of all abilities and disabilities in San Mateo County and beyond! We plan to complete construction and open to the public in Summer 2019.
- ▶ Magical Bridge Playground Projects are also underway in Morgan Hill, Mountain View, and Sunnyvale.

# Moving Forward - 2018



A working design particularly catered to the needs of those with mobility challenges.

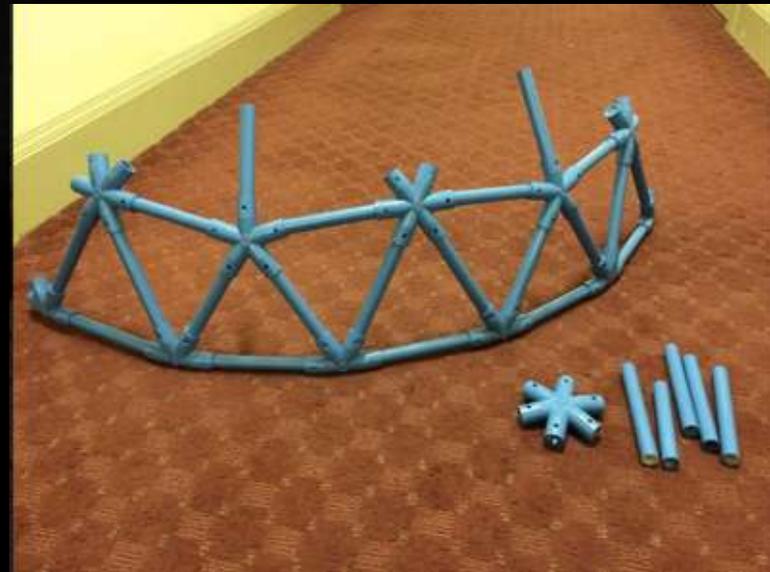
The user utilizes their mechanical energy to rotate a crank to move the structure in a circular path.

# Sensory Wall Panel - 2016



- ▶ Team worked collaboratively on overall structure to mount prototypes.
  - ▶ Individual team members each focused on individual prototypes.
- 
- ▶ QR Codes with links or text to provide information for the visually impaired
  - ▶ Pick up and play musical instrument.
  - ▶ Tactile puzzle with slideable pieces.
  - ▶ Slideable bead exploration.
  - ▶ Tactile Braille exploration for the visually impaired and the sighted.

# Sensory Dome - 2016



# Jay's notes regarding prototyping for the Magical Bridge Playground



- ▶ There will be an opportunity to get information about the project and feedback about teams' fabricated prototypes on site from playground visitors.
- ▶ The prototypes can be as rough or refined as your team chooses - we just want to understand your vision about how your design would work in an actual playground application.
- ▶ Prototypes can be strictly mechanical, structural, electrical, conceptual, or some combination thereof.
- ▶ Student prototypes may not necessarily be installed in a playground.
- ▶ Designs that would be large in the real world should be prototyped at reduced scale.

# Playground Equipment for Students with Learning Disabilities and Challenges in Speech & Language



- ▶ Playground Equipment for Students with Learning Disabilities and Challenges in Speech & Language - Jay Gluckman
- ▶ Explore designs to create new play and educational experiences incorporating multiple senses and actions for all playground users and visitors that could also have positive outcomes for those with learning disabilities and challenges in speech & language.



# Playground Equipment along the Fence



- ▶ **Playground Equipment along the Fence** - Olenka Villarreal
- ▶ Explore designs to create new play and educational experiences along the fence that incorporate multiple senses, actions, and outcomes for all playground users and visitors, especially those with visual impairments and diminished fine motor skills.



# Be Part of the Magic - Join Us!



  
**MAGICAL BRIDGE**  
FOUNDATION

Jay Gluckman  
jaygluckman@gmail.com

Olenka Villarreal  
olenka@magicalbridge.org

# Elbow Lifter

- ▶ **Elbow Lifter** - Angie Lee
- ▶ Explore device designs that would enable Angie to feed herself completely independently.



[Video](#)



# Elevator Button Pusher

- ▶ **Elevator Button Pusher** - Angie Lee
- ▶ Explore device designs that would enable Angie to ride elevators independently.



[Video](#)



# Laptray for Daniel

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



# Laptray for Daniel's Independence



- ▶ Meet Daniel & Stanford Stickney
- ▶ Cerebral Palsy
- ▶ Cortical Vision Impairment



# Laptray for Daniel's Independence



- ▶ Explore ways for Daniel to easily access and store personal items on his manual wheelchair such as:
  - ▶ Phone
  - ▶ Water bottle
  - ▶ Clothes
  - ▶ Computer
  - ▶ Cat food



- ▶ Explore a mechanism to retrieve items when they fall on the floor

# Laptray for Daniel's Independence



- ▶ Smile & the World Will Smile Back

# Donna's Pick Me Up

- ▶ Donna's Pick Me Up - Donna Yeager
- ▶ Explore design solutions that would enable Donna to retrieve items from the floor



# Donna's Pick Me Up



Donna in her motorized Permabill wheelchair

# Donna's Pick Me Up



Donna tries to pick up a 10 pound item from floor, but due to arthritis in her toes, she is unable to lift more than 1 pound.

# Donna's Pick Me Up



The goal is to lift items 25 inches from the floor to "toe-level".



# Wheelchair Dancing



- ▶ **Wheelchair Dancing** - Amy Li
- ▶ Explore designs to provide encouragement and enhance the dance experience for both wheelchair users and individuals who can not stand for long periods.

On deck: Nick Zirpolo

# Dancing Frequently Reduces the Risk of **Dementia by 76%!**



New England Journal of Medicine, 2003

# Dancing Reduces 46% Cardiovascular Disease Death



American Journal of Preventive Medicine, 2016

Creative Arts Therapy (Music/Dance/Art) Improves Cancer Patients'  
**Quality of Life by 50%, Reduces Pain by 59%!**



The JAMA Network, 2013

# Exercise May Make Tumors Less Aggressive



American Cancer Society, 2015

# Penguin Coldcap to Save My Hair from Chemo



# Problem: Isolated and Lonely, Tough Behavior Challenge

Loneliness is as damaging as smoking **15 cigarettes** a day

- Leads to depression, anxiety, pain, falling, hostility, weight issues, diabetes, and suicidal thoughts.
- Caregivers/patients do not have enough exercise.
- Social connection from home is difficult.
- Current solutions are not adequate.



**40%** of Alzheimer's caregivers die before care recipient.

**62%** of teenagers feel lonely, especially those with caregiver parents.



Creative Arts Therapy (music/dance/art) improves cancer patients'  
**Quality of Life by 50%, reducing pain by 59%!**



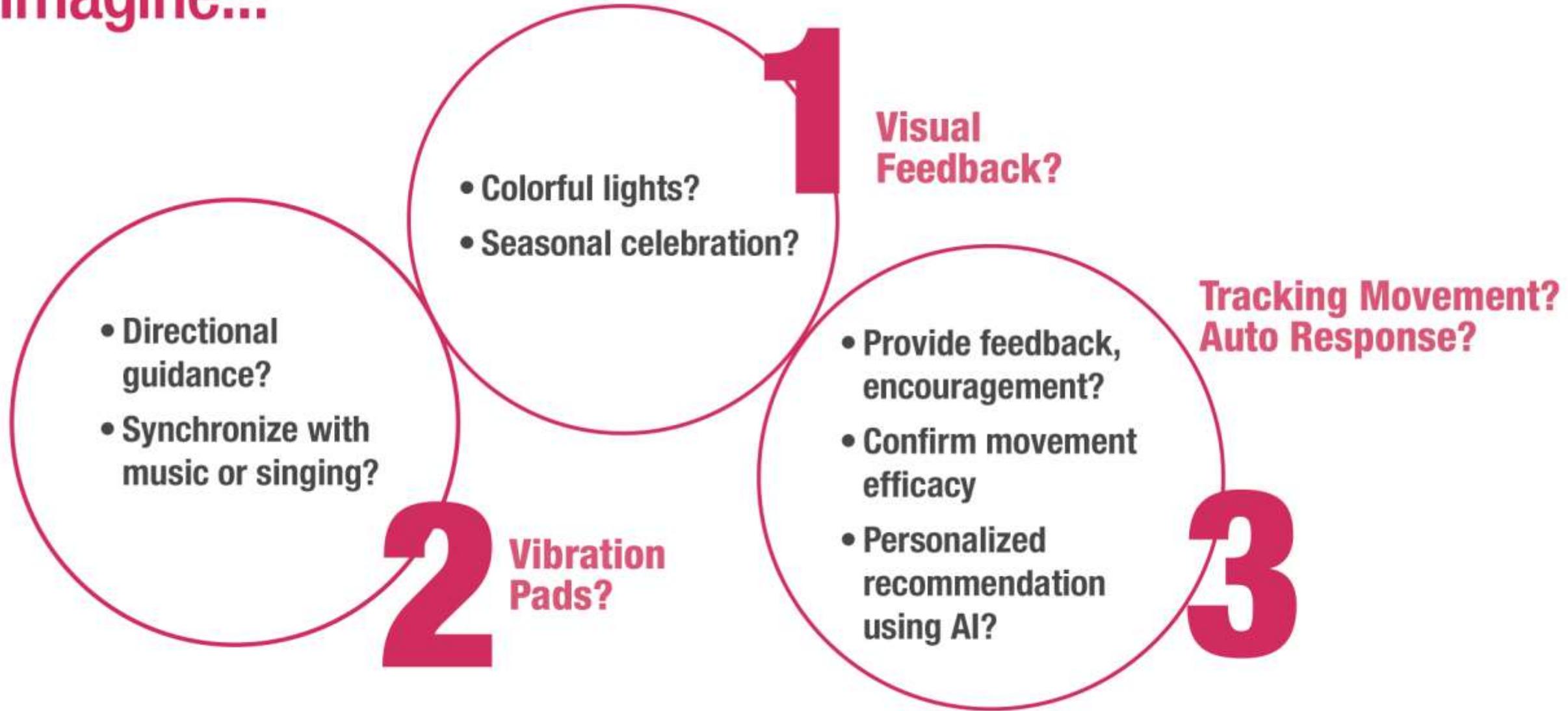
The JAMA Network, 2013

[View video](#)



[View video](#)

# Imagine...





[View video](#)

# Creative Expression using an Instrumented Wheelchair



- ▶ Creative Expression using an Instrumented Wheelchair - Amy Li
- ▶ 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.



# Hide-Away Lap Tray

- ▶ **Hide-Away Lap Tray** - Nick Zirpolo
- ▶ Explore designs for a compact lap tray that would prevent objects on his lap from falling and would support his laptop computer.



# Projects Suggested by Others, Pitched by Dave

- ▶ [Clean House Project](#) - for June Fisher
- ▶ [Within Reach Project](#) - for June Fisher
- ▶ [Get a Grip Project](#) - for Debbie Pitsch



# Clean House Project

- ▶ **Clean House Project** - June Fisher (pitched by Dave)
- ▶ **Background:** June is an older adult who uses a rollator for balance and stability when moving around her San Francisco home.
- ▶ **Problem:** June's use of her rollator makes it difficult for her to perform home cleaning tasks independently.
- ▶ **Aim:** Explore designs to provide a safe, effective, and independent means of performing common household cleaning tasks
- ▶ **Criteria:** The solution must be safe to use, easy to operate, and be compact to store.



# Within Reach Project



- ▶ **Within Reach Project** - June Fisher
- ▶ **Problem:** Currently available step stool solutions do not meet June's needs: some are too tall, others have a stepping area that is too small, and most do not have hand-holds to provide needed balance and stability during reaching. Finally many step stools are heavy and bulky, making them difficult to move and position.
- ▶ **Aim:** Explore designs to provide a safe and stable means of accessing items on upper shelves
- ▶ **Criteria:** The solution must be easy to move and position, offer a sense of security during use; have a wide, non-slip surface; provide the proper height advantage; and be collapsible for storage.



# Get a Grip Project



- ▶ **Get a Grip Project** - Dave for Debbie Pitsch - VA Palo Alto Health Care System, Spinal Cord Injury Service
- ▶ Explore designs that would enhance a handbike user's with quadriplegia ability to pedal the Freedom Ryder.



# Dave's Suggested Projects

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



# 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.



# 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.



# Student-defined Team Projects



- ▶ **Student-defined Team 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



# Sample Individual Project - Assistive Technology Pop-Up Shop



- ▶ Problem: Many assistive technology products are too expensive for people with disabilities or older adults to purchase. Others are not covered by insurance. In addition, broken devices need to be repaired.
- ▶ Aim: Explore plans for a pop-up store that would repair devices and fabricate custom solutions.



Krystina Jackson

This is the last project

# Open Question Time and Non-Random Access



Who is  
working on  
**team**  
projects?



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  
are working on an  
**individual** project

# Reset the Tables & Chairs

