



health{hacks}

@Stanford | 2023



we assemble the
future innovators of healthcare.



**we build a launch pad to welcome
diverse creators since 2020.**



we create a
brighter future for all.



o



Day 1: Experience the power of collaboration.

Meet, connect, and brainstorm with a diverse group of creators.



o

Day 2: Enhance your knowledge and skills.

Iterate, design, and test out your healthcare solutions.



o



Day 3: Pitch your ideas to the world.

Showcase your project to judges and get the chance to win prizes

TRACK 01

mental health &
addiction

TRACK 02



aging &
longevity



TRACK 03

population & preventative health

SPONSORED CHALLENGE

The Infosys logo is displayed in a large, blue, sans-serif font. It is centered within a rounded rectangular frame that has a double border. The top border is orange and the bottom border is purple, creating a gradient effect at the corners.

interoperability | care | nurse shortages | disease management

Participant Dashboard

< April 14, 2023 >

05:00 PM	Participant Welcome — 05:00 PM Huang health{hacks} HQ
06:00 PM	Dinner — 06:00 PM Huang health{hacks} HQ
07:00 PM	Opening Ceremony — 07:00 PM Hewlett 200
08:00 PM	Biodesign Needs Workshop — 08:00 PM
09:00 PM	Team Formation Session — 08:30 PM AL: Hewlett 200, PP: Huang health{hacks} HQ, MH: Huang Forbes Cafe

Days until health{hacks} 2023:

0 1 1 7 5 6 1 1

Days Hours Minutes Seconds

Launch Pad

[Participant Handbook](#)[Venue Map](#)[Join Our Slack](#)[Office Hours](#)[Emergency Help](#)

Team Formation

**William Pan**

williampan@stanford.edu

[Register Team](#)

Final Submission

Upload Your Final Presentation Slides

Submit a Google Drive link

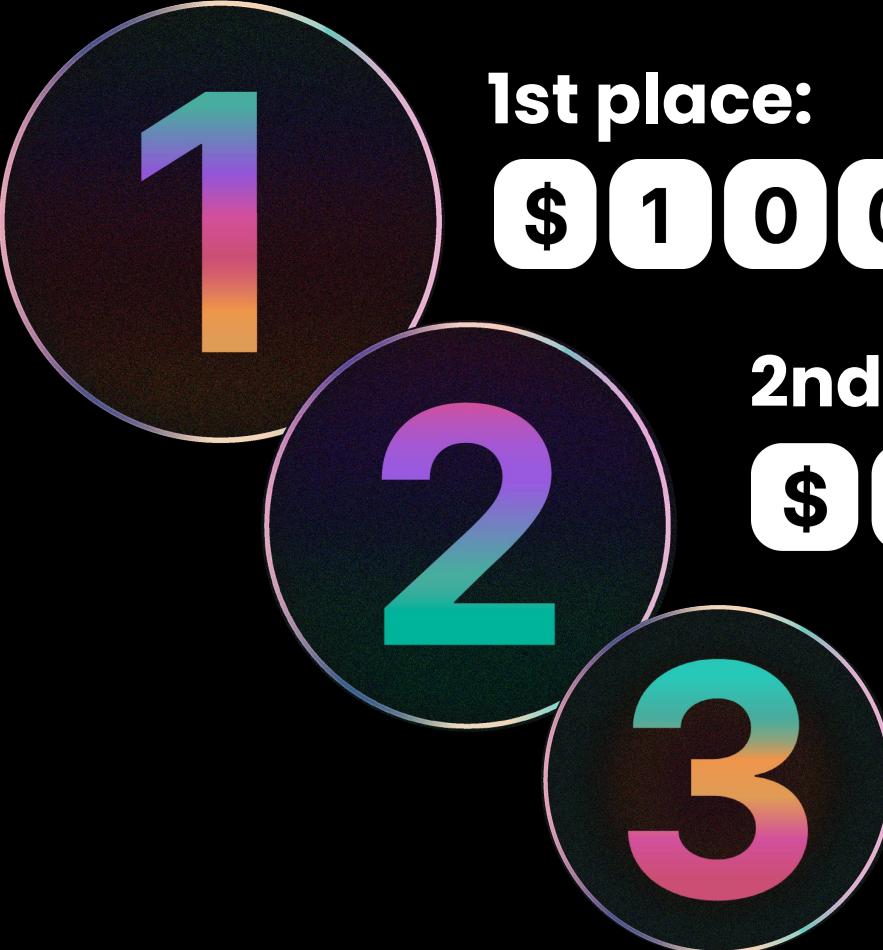
Team / Project Name

Type your team/project name

Description

We'd love to hear a short blurb about your project in a couple of sentences ...

Submit



1

1st place:

\$ 1 0 0 0

2

2nd place:

\$ 5 0 0

3

3rd place:

\$ 2 5 0



Infosys

1st place:

\$750

**BEST
BUY™**



2nd place:

\$ 5 0 0

2

3rd place:

\$ 2 5 0

3

All 3 winners will be fast tracked into the InStep
internship with only final rounds of interviews

sponsors



Infosys®



exai



STANFORD BYERS CENTER FOR
BIODESIGN



STANFORD
BIO-X



SSB



Ravi Pamnani

Instructor at Stanford Byers Center for Biodesign



Michelle deHaaff

Assistant Director of Digital Health for the Stanford Byers Center for Biodesign



Kevin Bui

Instructor at Stanford Byers Center for Biodesign



Necessity: the mother of invention

health{hacks} @ Stanford
14 APR 2023

Kevin Bui, Michelle De Haaff, Ravi Pamnani



- **Dean Kamen (inventor):** “Will be to the car what the car was to the horse and buggy.”
- **Steve Jobs:** “As big a deal as the PC.”
- **John Doerr (venture capitalist):** “More important than the internet. Will be the fastest company to reach \$1 billion in sales.”
- **Jeff Bezos:** “Cities will be built around the device.”





Segway Performance

- Launched Dec 2001 with a sales target of 40,000 units/month
- Company sold 30,000 units... from 2001-2007
- Shut down in 2020 with 140,000 total units sold
(avg. 614 units/month)

Inc.

NEWSLETTERS SU

INNOVATE

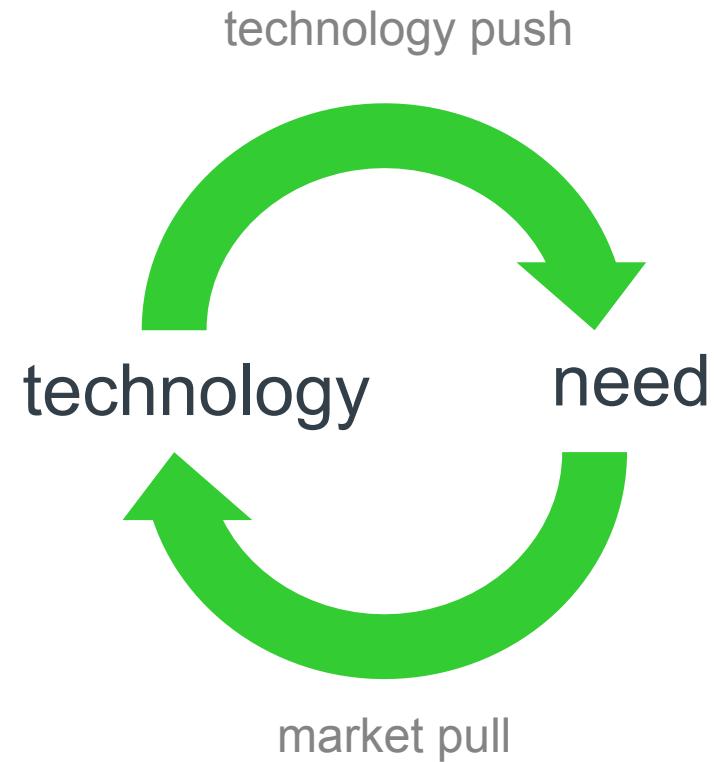
Why Electric Scooters Succeed Where Segway Failed

Your offering should be a
cheap, convenient, easy service. ☀

BY JEFFREY PHILLIPS, SENIOR CONSULTANT, RTI INNOVATION ADVISORS @OVOINNOVATION



Getty Images



The Case for Need-Based Innovation in Health Care



- Takes significant resources to bring to market; **don't waste money and your time**
- Payer is often different from the user and from the beneficiary; **understand the many different stakeholders**
- Need a lot of support from advisors, investors, collaborators along the way; **get them to share your vision**

Need Statement

A way to [problem] in [population] in order to [outcome]

A way to stabilize blood sugar in people with Type 2 diabetes
to stop progression to insulin dependence

Need statement tip #1

- Need statements must be solution agnostic
- Do not embed solutions into the need statement
- This limits the range of potential solutions that can address the opportunity



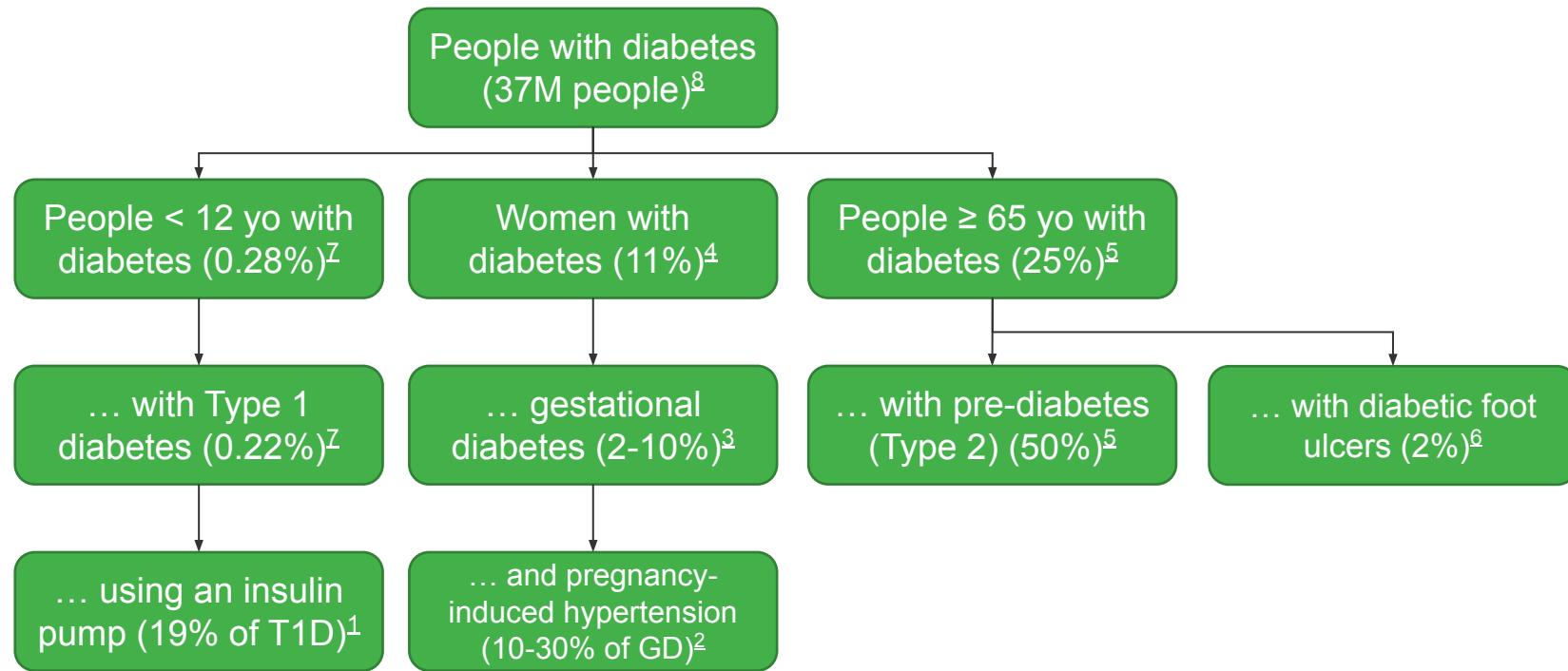
A **glucometer** that communicates with your phone in people with diabetes to enhance compliance with dietary goals.



A way to monitor risk of hypoglycemia in people with diabetes to enhance compliance with dietary goals.

Need statement tip #2

Populations are not homogenous



Need statement tip #3

Outcomes must be quantifiable and objectively assessed

Desired Outcomes	As Measured By...
Improved clinical efficacy	Treatment success rates in clinical trials
Increased patient safety	Rate of adverse events in clinical trials
Reduced cost	Total cost of product/service relative to available alternatives
Improved physician/facility productivity	Time and resources required to perform procedure
Improved physician ease of use	Solution of complex workarounds and/or the simplification of workflow
Improved patient convenience	Frequency and occurrence of required treatment, change in treatment venue (inpatient versus outpatient, physician's office versus home), etc.
Accelerated patient recovery	Length of hospital stay, recovery period, and/or days out of work

Need statement tip #4

- It's not uncommon to get confused about problems and outcomes – think about CAUSALITY

A way to [problem] in [population] in order to [outcome]

What change could we catalyze...

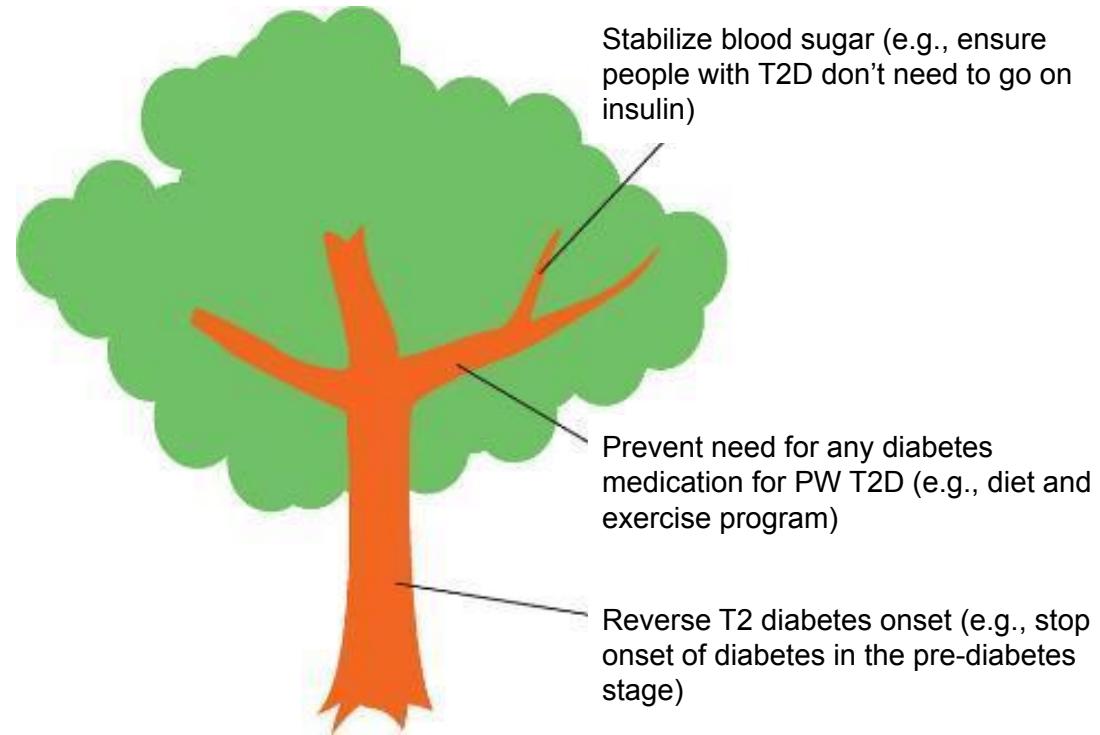
stabilize blood
sugar

...to create a desired effect?

stop progression
to insulin
dependence

Need Scoping

- Play with the focus of your problem, population, and outcome
- Experiment with different levels of specificity
- Consider superseding needs...
- Goal = A need that is detailed and actionable without being too limiting



Need Scoping



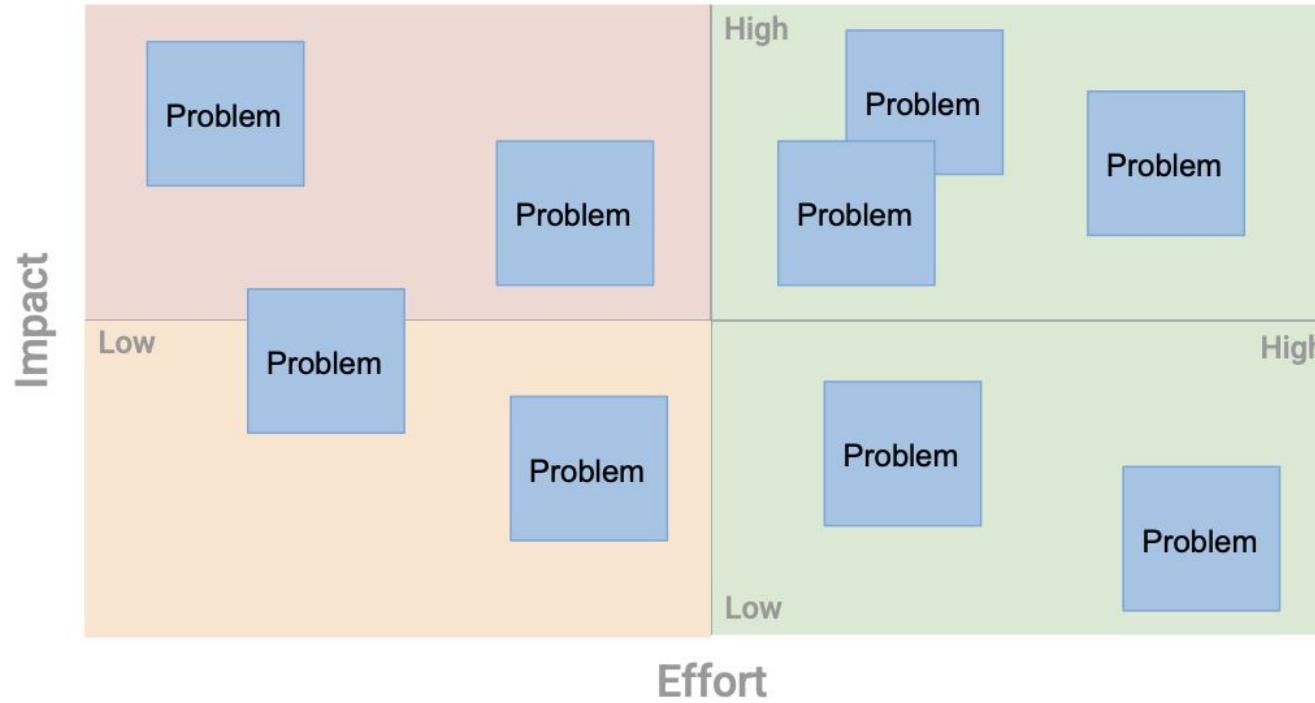
Are you solving the right problem?



“What’s good about that?”



Which problem are you focused on and why?



The solution: The Embrace Portable Incubator

> 450,000 lives saved



Need Characterization Worksheet

Paper Handout

STANFORD BYERS CENTER FOR BIODESIGN

NEED CHARACTERIZATION WORKSHEET
Go in with your eyes open!

v.2019.1

Who are you trying to help?	Be as specific as you can!		Examples:	
			<ul style="list-style-type: none"> Patients with diabetes Children with Type 1 diabetes in the US Mothers of children with Type 1 diabetes in rural or remote settings 	
What is their problem?	Try to boil it down to the key issue without mentioning any type of solution...		Examples:	
			<ul style="list-style-type: none"> A way to monitor glucose levels 24h/day A way to prevent hypoglycemia A way to easily track glycemic indices in foods 	
How does the problem impact your target user?	Inconvenient	Minor injury (fully recoverable)	Permanent injury (not disabling)	Permanent injury (disabling and cognitive)
How large is your target market?	How many users are there in your target geography? Examples: 500K new diagnoses/year in US, diff with chronic disease worldwide		Is this a need the user has once, or is it recurring? (daily, weekly, monthly, etc.)	
Who else is affected by your problem?	Examples: Patient's family, doctor, health facility, insurance co.		Examples: Happy, tolerant, frustrated, miserable	
How happy or dissatisfied are they with the status quo?				
If you could solve this problem, who is most likely to foot the bill?	Who's the key decision maker? Is a new solution more likely to reduce or add cost for this entity?		How much is this entity potentially willing to pay? (think about current cost as a benchmark)	
What desired outcome is most important to the entity that will pay for a new solution?	Examples: Better, more consistent glycemic control; fewer ER visits; lower long-term complications (e.g., vision loss)		How would you reliably and accurately measure this outcome?	
What are the top 3 criteria your new solution must meet to have a shot at being adopted?	Examples: Must cost <\$100, must reduce HbA1c by 50%, must be usable by a child			
Be quantitative!	1.			
	2.			
	3.			

<http://bit.ly/biodesign-need>

Stanford

STANFORD BYERS CENTER FOR BIODESIGN

NEED CHARACTERIZATION WORKSHEET
Go in with your eyes open!

Who are you trying to help?
Be as specific as you can! For example:

- Patients with diabetes
- Children with Type 1 diabetes in the US, or
- Mothers of children with Type 1 diabetes in rural or remote settings

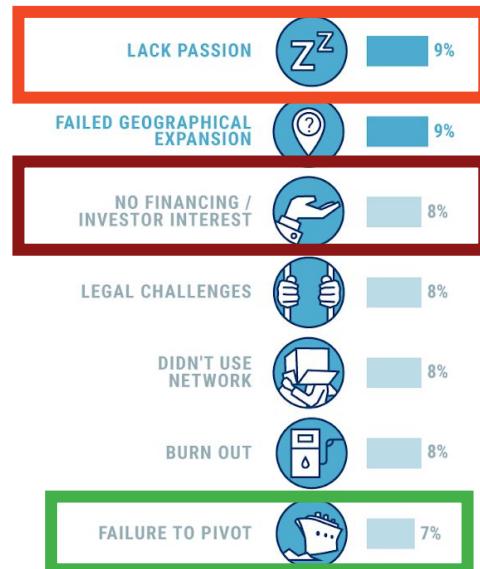
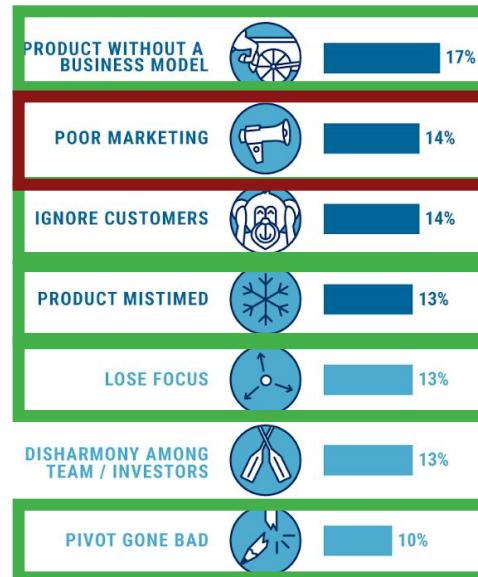
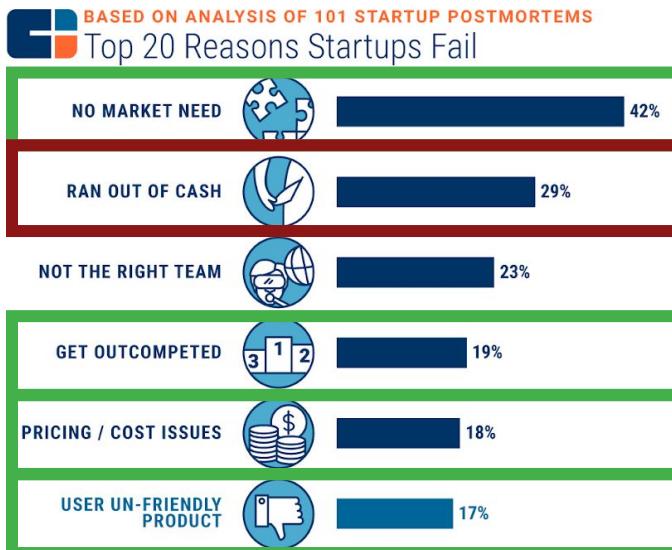
What is their problem?
Try to boil it down to the key issue without mentioning any type of solution. Examples:

- A way to monitor glucose levels 24h/day
- A way to prevent hypoglycemia
- A way to easily track glycemic indices in foods

How does the problem impact your target user?

Inconvenient	Minor injury (fully recoverable)	Permanent injury (not disabling)	Permanent injury (disabling and cognitive)	Death
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Why Startups Fail: Don't Understand the Need



Biodesign Classes @ Stanford

<http://biodesign.stanford.edu/programs/stanford-courses.html>

COURSES	FALL	WINTER	SPRING	SUMMER
Biodesign Fundamentals (U)				
Biodesign Innovation (G) (P)				
Biodesign for Digital Health (U) (G) (P)				
Biodesign for Societal Health (G)				
Bioengineering Capstone (U)				
Building for Digital Health (U) (G)				
Global Biodesign (U) (G) (P)				
Medical Device Innovation (U)				
Pathophysiology and Design (U)				
Technology Assessment (U) (G) (P)				

Stanford undergraduates (U), graduate students (G), and PhDs/postdocs (P)



Thank you!

<http://biodesign.stanford.edu/>

Day 1

05:00 PM

Participant Welcome

health{hacks} HQ

06:00 PM

Dinner

health{hacks} HQ

07:00 PM

Opening Ceremony

Hewlett 200

08:00 PM

Biodesign Needs Workshop — 08:00 PM

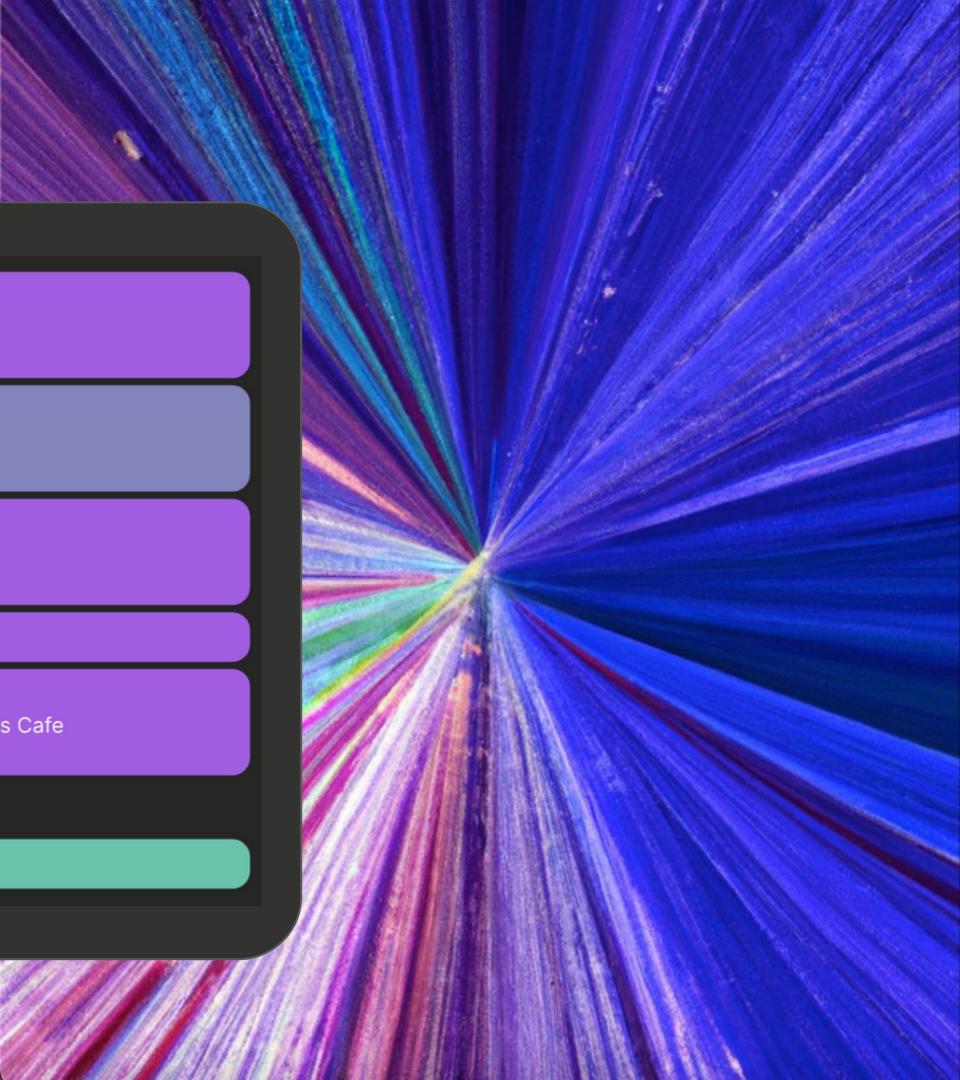
Team Formation Session — 08:30 PM

AL: Hewlett 200, PP: Huang health{hacks} HQ, MH: Huang Forbes Cafe

09:00 PM

10:00 PM

Venue Closes — 10:00 PM

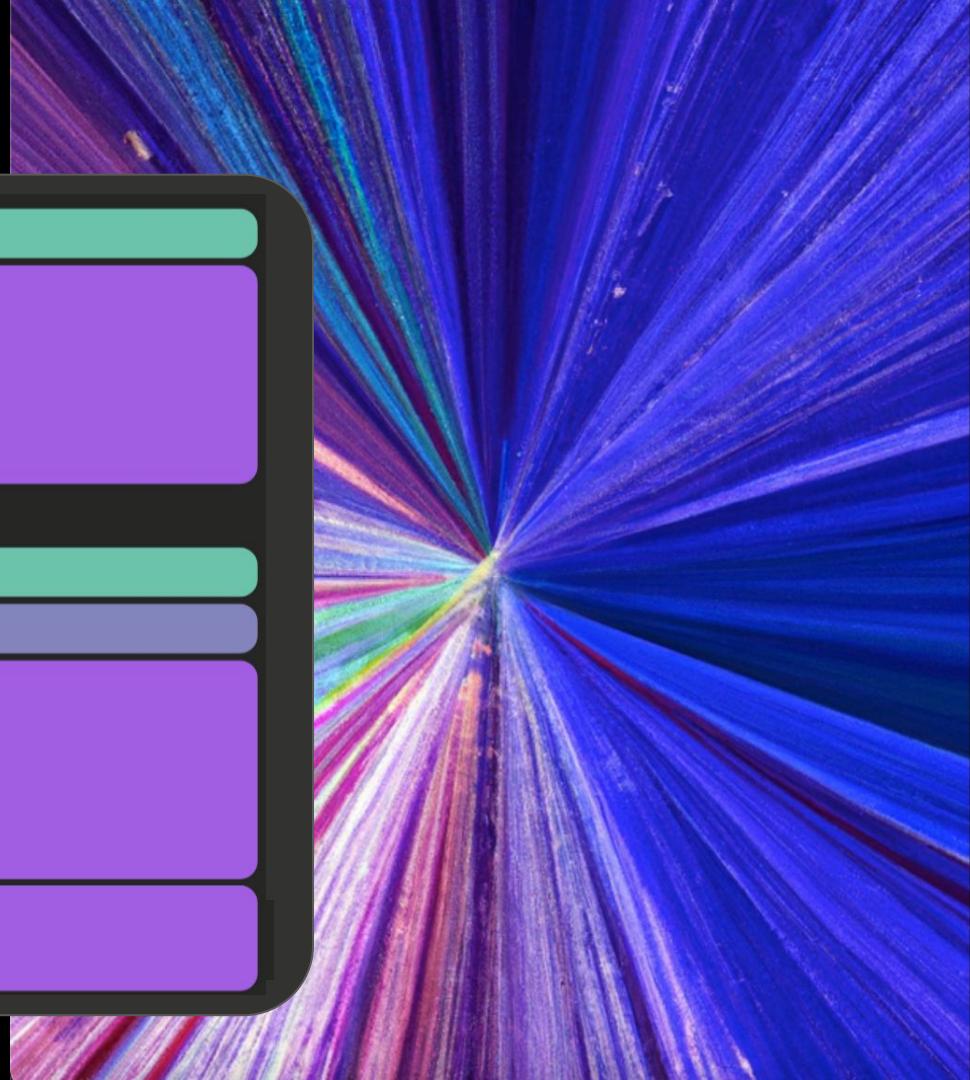


Day 2

08:00 AM	Venue Opens — 08:00 AM
11:00 AM	Brunch — 11:00 AM Huang health{hacks} HQ
12:00 PM	Team Registration Deadline — 12:00 PM
06:00 PM	Dinner — 06:00 PM Huang health{hacks} HQ
07:00 PM	Office Hours & Practice Pitching — 07:00 PM Huang Infosys, Stanford Biodesign, Exai Bio Room
08:00 PM	
10:00 PM	Venue Closes — 10:00 PM

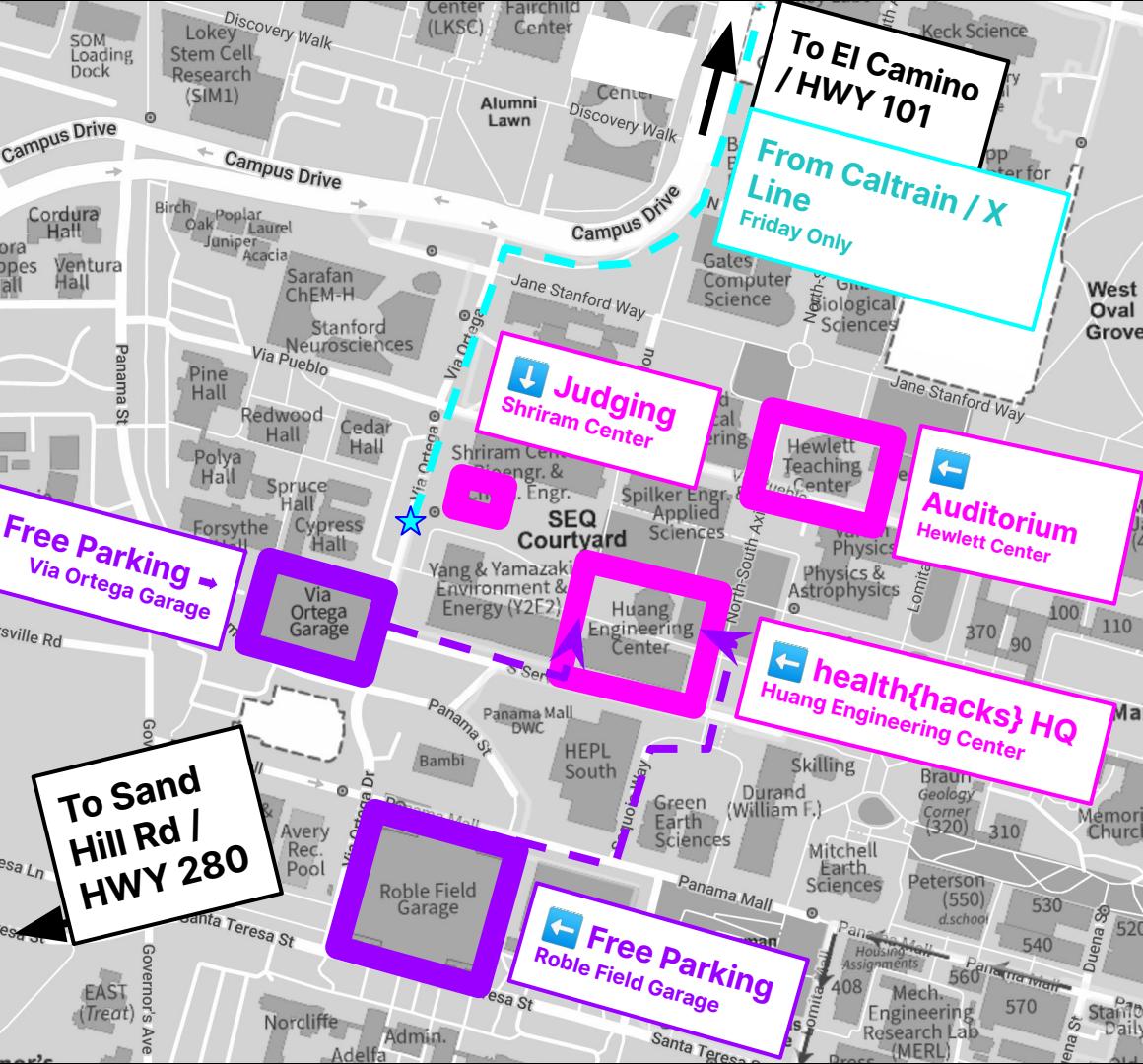
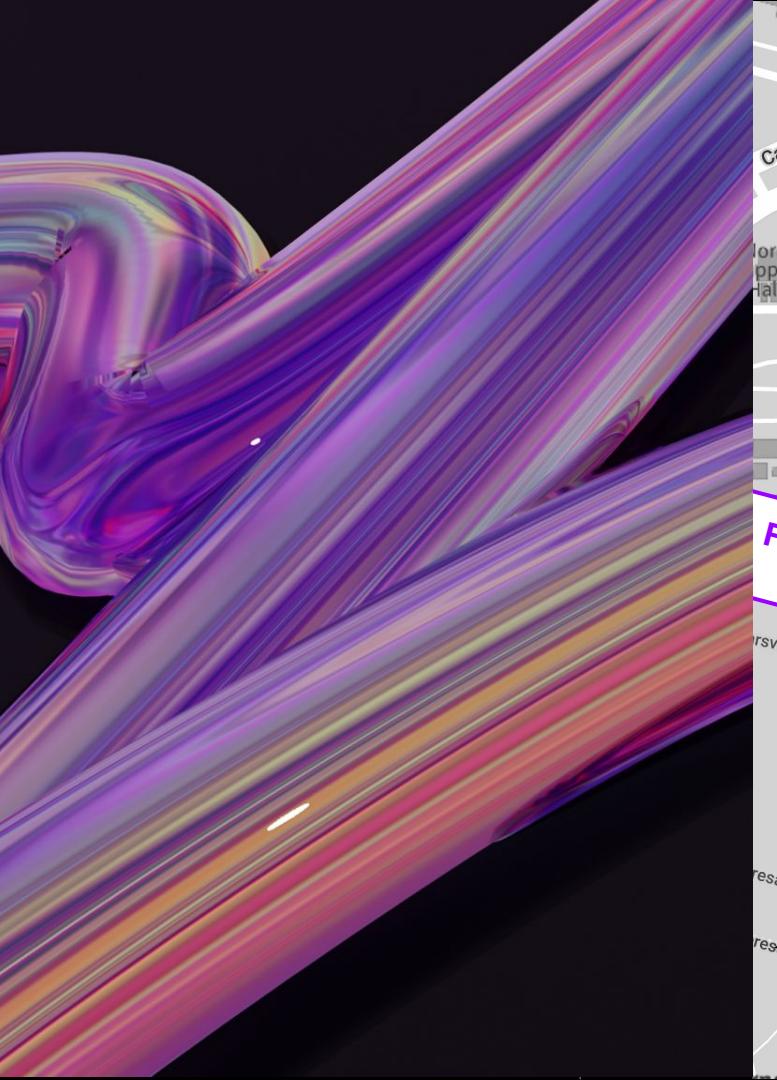
Day 3

08:00 AM	Venue Opens — 08:00 AM
09:00 AM	Office Hours & Practice Pitching — 08:30 AM Huang Infosys, Stanford Biodesign, Exai Bio Room
10:00 AM	
11:00 AM	Final Project Submission Deadline — 11:00 AM
	Brunch — 11:30 AM
12:00 PM	Project Judging — 12:00 PM AL: Hewlett 200, PP: Hewlett 201, MH: Shriram 104
01:00 PM	
03:00 PM	Awards Ceremony — 03:00 PM Hewlett 200





let's get innovating





Vadiraj Guttal

Associate Vice President & Head
of Infosys



schedule

SATURDAY 4/15 [Full Day]		
Time	Event Details	Location
8:30 - 11 AM	Brainstorming / Team Formation / Mentors Check-In	Huang Engineering Center <i>(health{hacks} Atrium)</i>
11 AM	Brunch	
12 PM	Team Registration Deadline → Start Working!	--
6 PM	Dinner	Huang Engineering Center <i>(health{hacks} Atrium)</i>
7 - 10 PM	Office Hours / Practice Pitching Sessions	

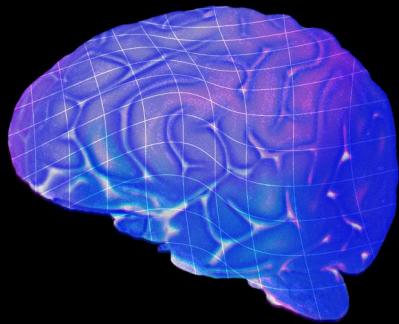


schedule

SUNDAY 4/16 [Day]		
Time	Event Details	Location
8:30 - 11 AM	Office Hours / Practice Pitching Sessions	Huang Engineering Center (<i>health{hacks}</i> Atrium)
11 AM	Judges Check-In	Huang Engineering Center (<i>health{hacks}</i> Atrium)
11 AM	Final Project Submission Deadline	--
11 AM	Brunch	Huang Engineering Center (<i>health{hacks}</i> Atrium)
12 PM - 2 PM	Judging Begins with Pitches from All Teams	<u>Aging:</u> Hewlett 200 <u>Population:</u> Hewlett 201 <u>Mental Health:</u> Shriram 104
3 PM - 3:30 PM	Awards Ceremony	Hewlett Center (Hewlett 200)



tracks



mental health &
addiction

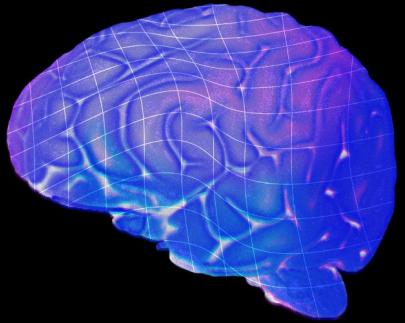


aging & longevity



population & preventative
health

tracks



mental health &
addiction



aging & longevity



population & preventative
health



