



# UC San Diego

## Therapeutic Robotic Interactive Canine Companion (TRICC)

**Presenters:**

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**Stakeholders:**

Dr. Stacey Veyra-Braendle

Dr. Christine Grosso

# Grand Overview of Stakeholder and Project

## Stakeholders:



**Dr. Stacey  
Vieyra-Braendle**



**Dr. Christine  
Grosso**

- Occupational therapists at Kaiser Permanente (hospital) in Oregon.
- Work in acute care.

## Purpose:

- Help clients with dementia and other conditions

## Goals:

- Provide a companion animal-like robot.
- Provide clients with **stimulus**.
- Promote consistent therapy and **engagement**.
- Facilitate client **focus and calm**.



# Methodology

## Features of TRICC (Therapeutic Robotic Interactive Canine Companion)



- ❖ TRICC imitates the physical state of a dog by:
  - Having a soft heartbeat
  - Emitting “body heat”
  

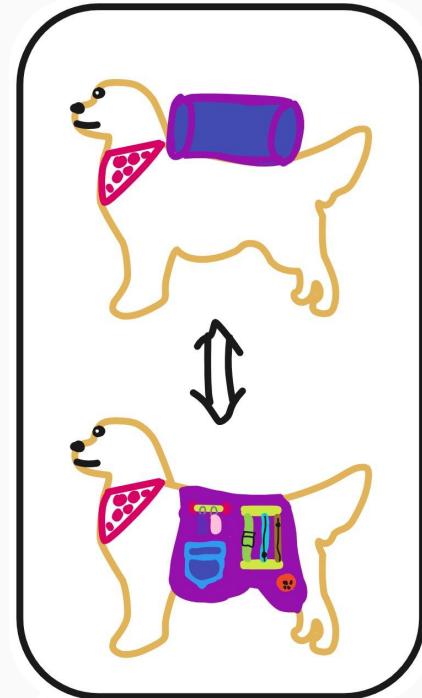
A red heart shape containing a white ECG line, symbolizing a heartbeat.

An orange circle containing a thermometer, symbolizing body heat or temperature.

  
- ❖ TRICC is interactive. When petted on the back, TRICC would respond by:
  - Nudging its head
  - Wagging its tail

# Methodology

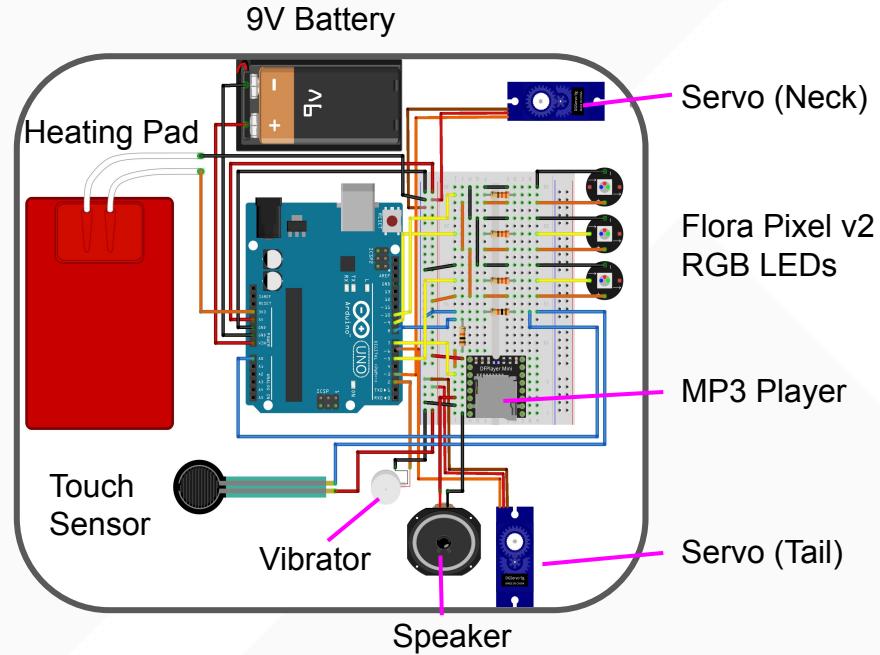
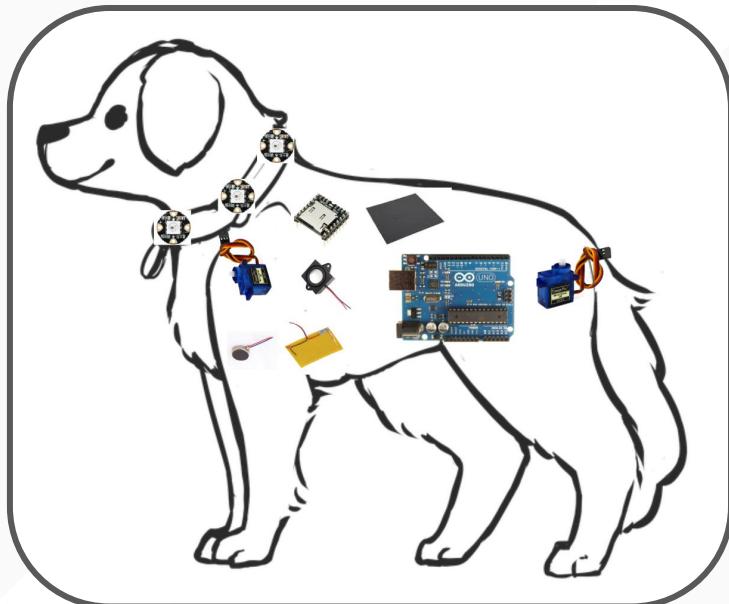
## Features of TRICC (Therapeutic Robotic Interactive Canine Companion)



- ❖ TRICC draws the user's attention. After one minute of not interacting with TRICC:
  - The leds on TRICC's collar will light up
  - TRICC will bark
  
- ❖ TRICC carries a busy blanket, providing users with another form of distraction and occupation.

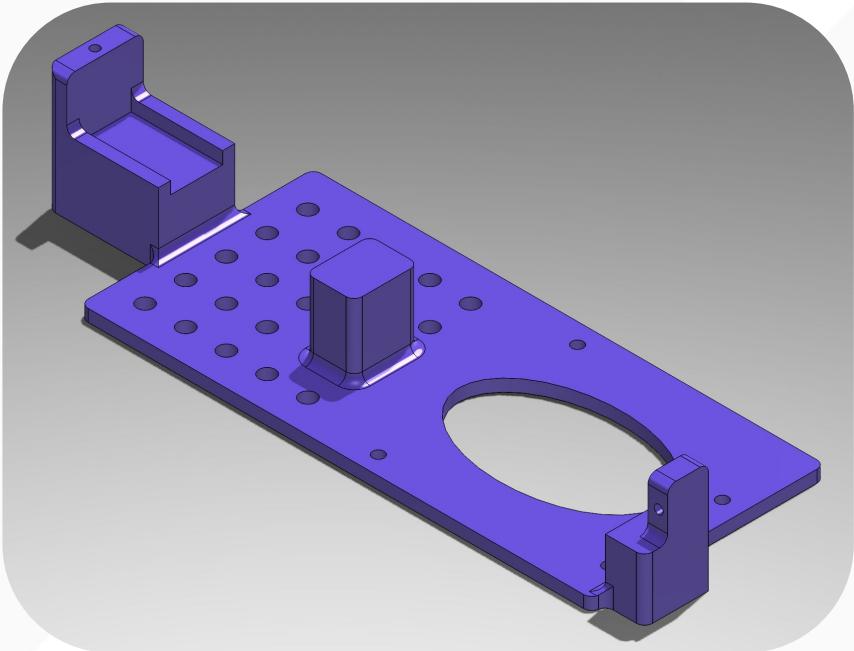
# Methodology (continued)

## Electrical Circuit System Design

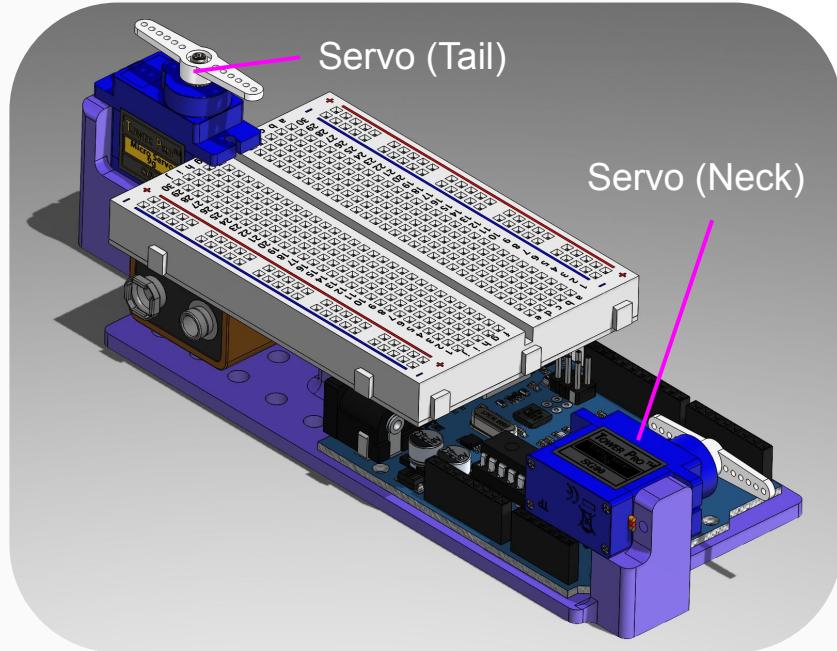


# Methodology (continue)

## 3D Modeling and 3D Printing



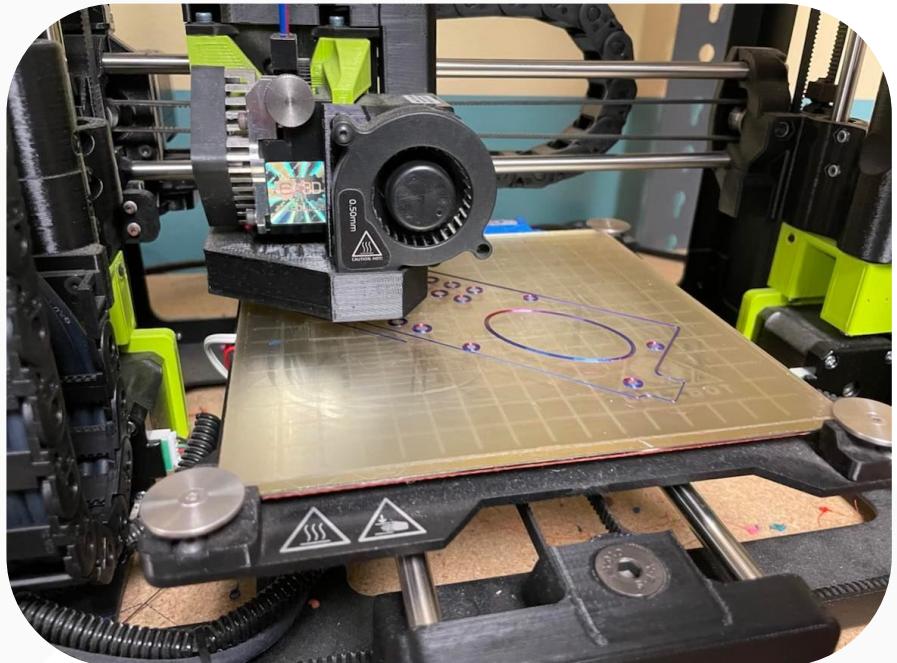
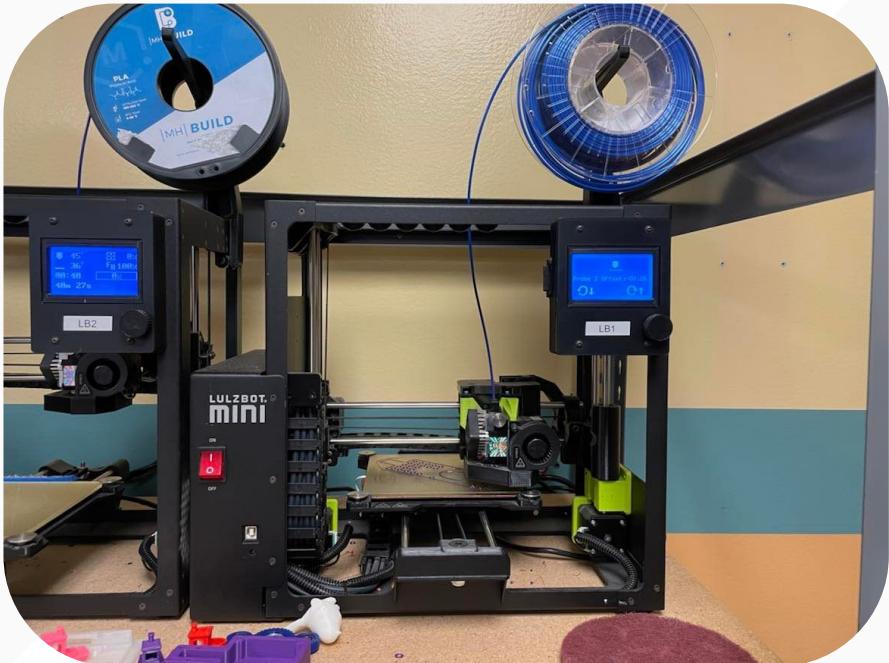
Skeleton Part



Skeleton Assembly

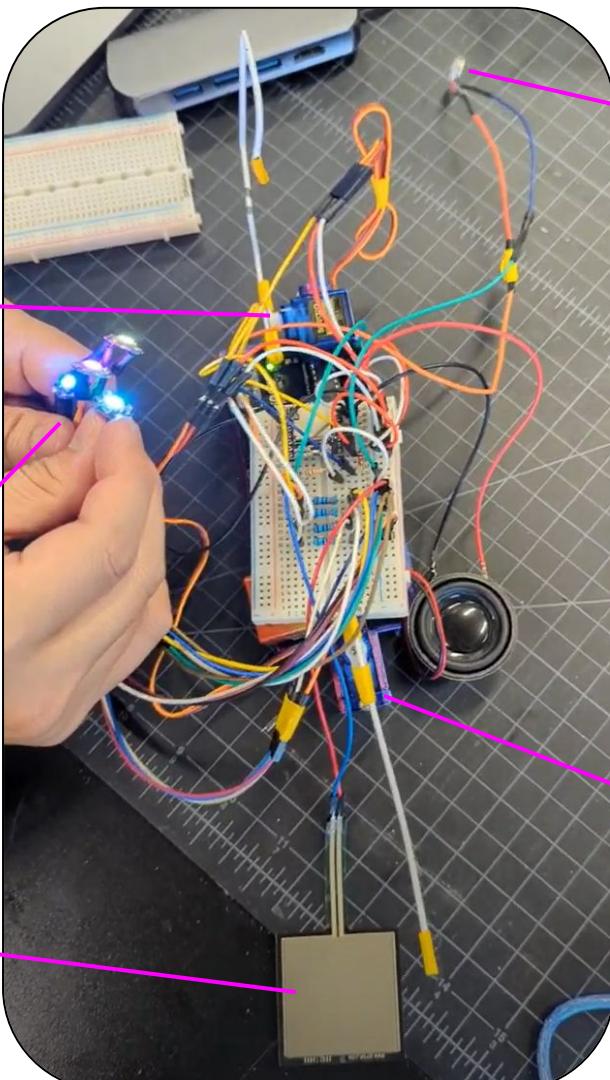
# Methodology (continue)

## 3D Printing TRICC Internal Body Structure



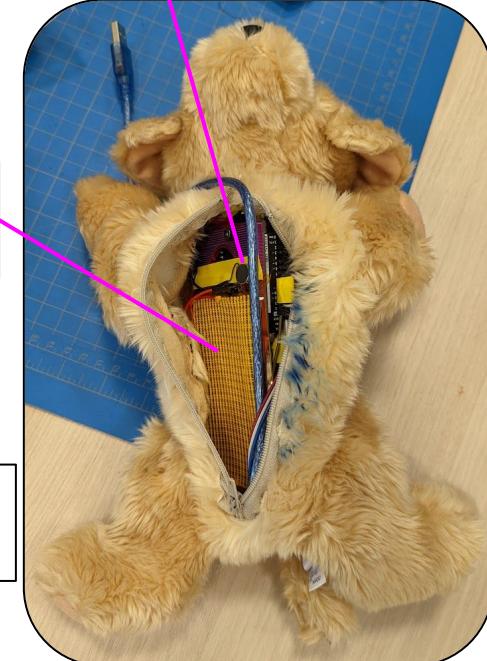
# Circuit & Components

Neck Servo -  
Head Nodding



Flora RGB Smart  
NeoPixels - Collar  
Lights

Vibration Motor - Heartbeat Simulator



Force Sensor -  
Petting Detector

Heating Pad -  
Body Warmth

Tail Servo - Tail  
Wagging

# Busy Blanket Brainstorming



Tying/  
unting yarn

Buttoning and  
un-buttoning

Pom-poms  
(in a fabric  
envelope?)

Ribbon Hooks

Beads on a  
string

Photograph  
of loved  
one or pet?



# Finalized Busy Blanket Activities



# Busy Blanket Result



## Results and Roadblocks

- Stakeholder evaluation:
  - Positive feedback
  - Questions about more options for moving robot neck
- Roadblocks in design and building process:
  - DFPlayer incompatibility (affected sound)



## Demo Video



## Potential Next Steps

- Add barking audio to grab user attention
- Customization to particular client needs
- Add more movement to the neck
- Musical companion— playing calming music



## Lessons Learned

- Listen to stakeholders and work with them actively
- Research prior to deciding on ideas
- Work on one component at a time



# Thank you!

**Dr. Stacey Vieyra-Braendle**

**Dr. Christine Grosso**

**Dr. Laurel Riek**

**Sachi Matsumoto**

**EnVision**  
Arts and Engineering Maker Studio

**UC San Diego**  
JACOBS SCHOOL OF ENGINEERING

# UC San Diego

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## Q&A