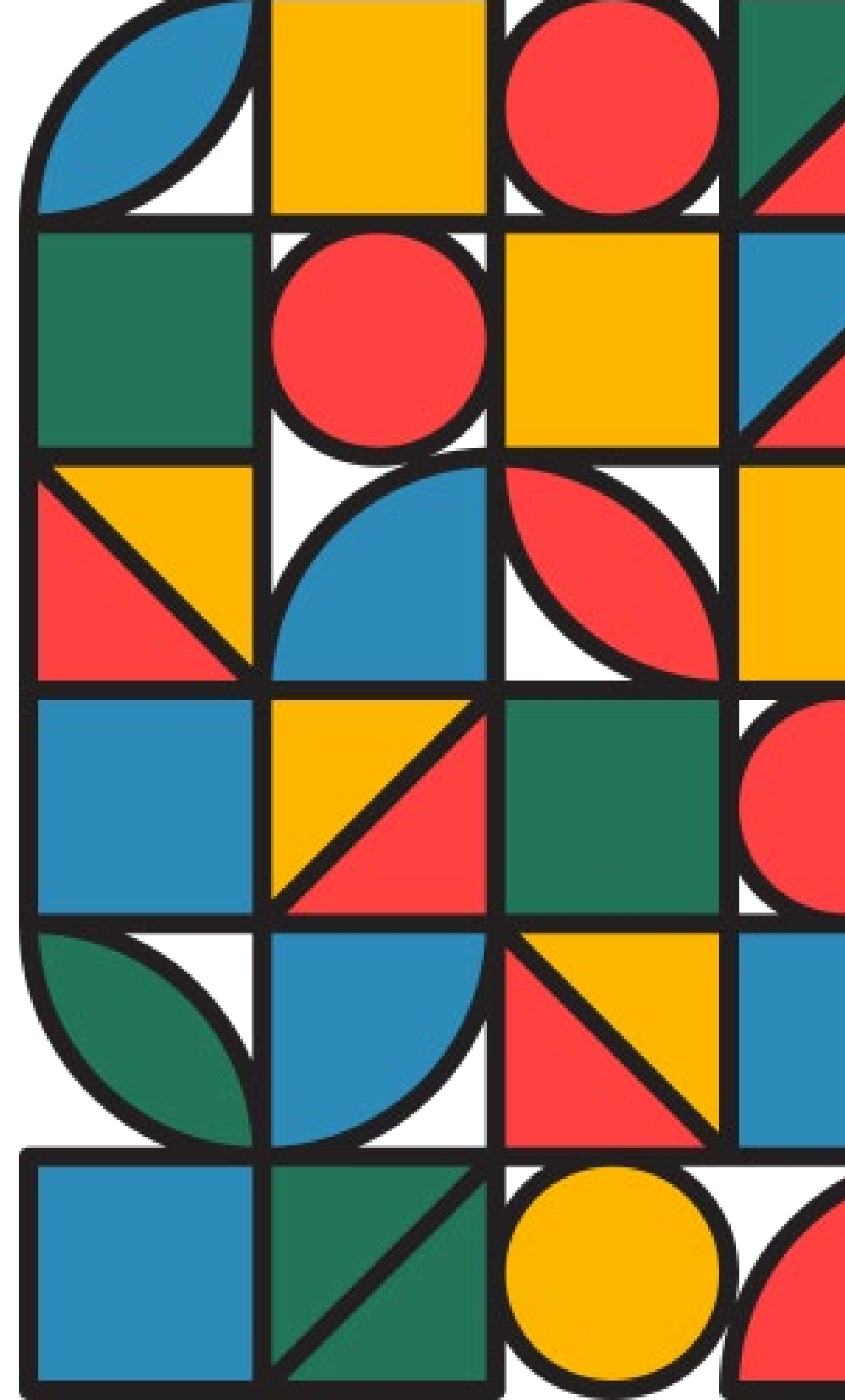




System Engineering and Engineering Method for Mechatronics



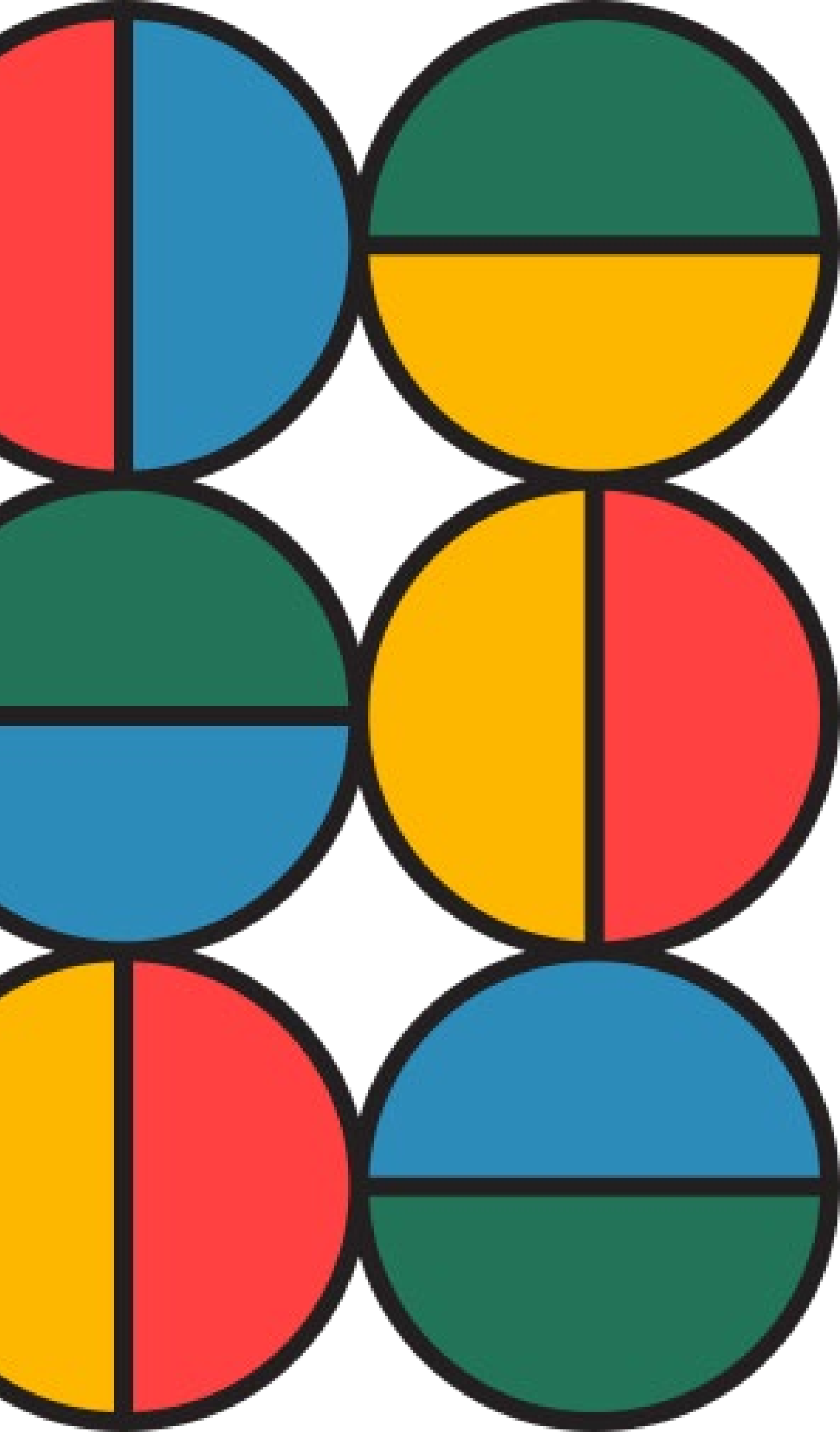


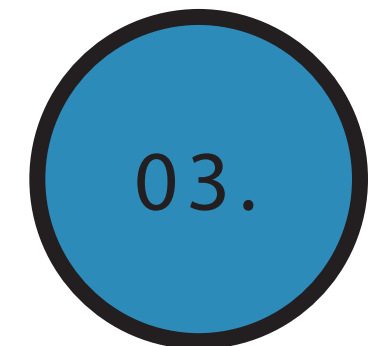
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Robotics Skillset

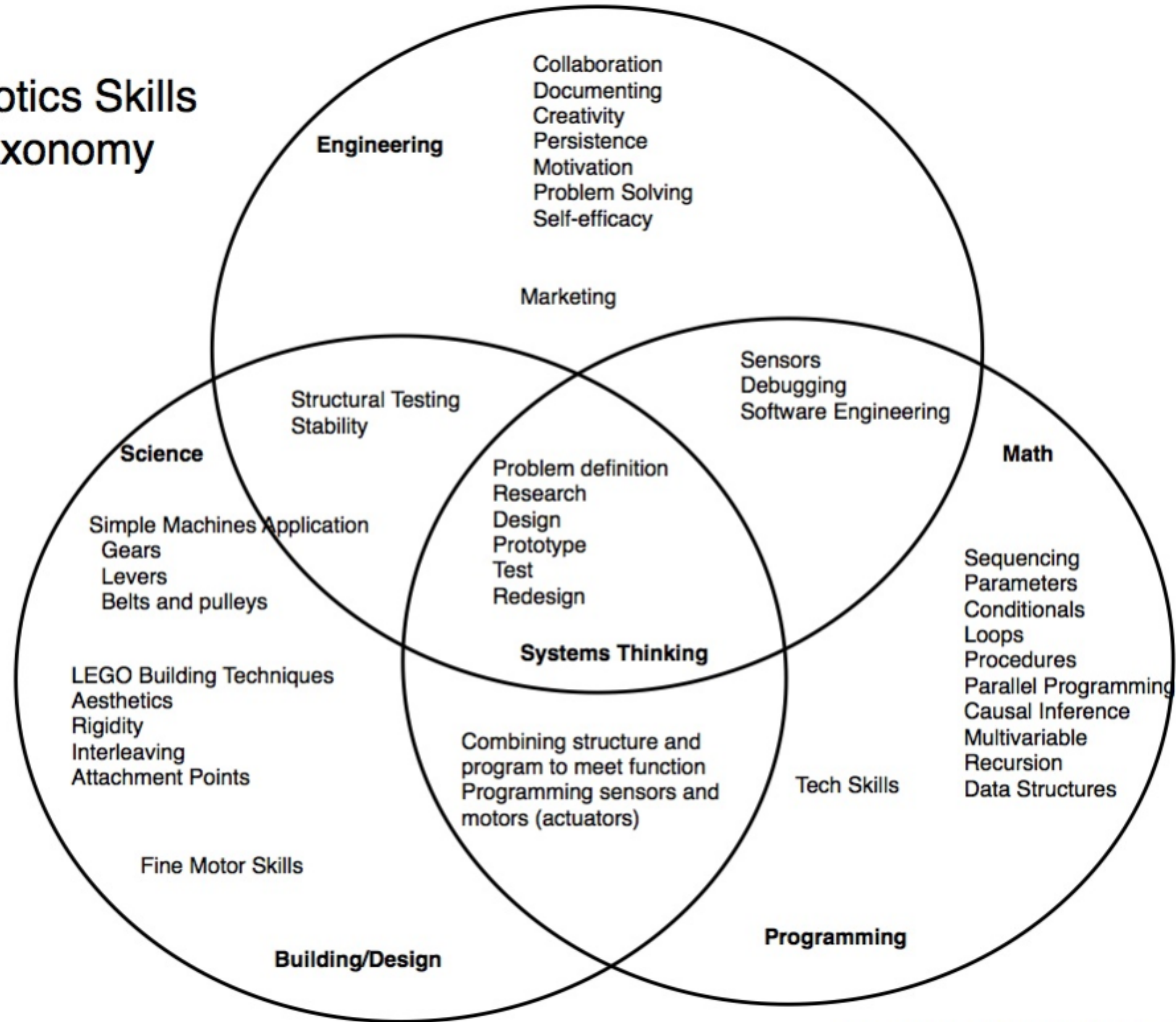


Engineering vs
Scientific
Method



Problem Solving
Cycle +
Requirements.

Robotics Skills Taxonomy



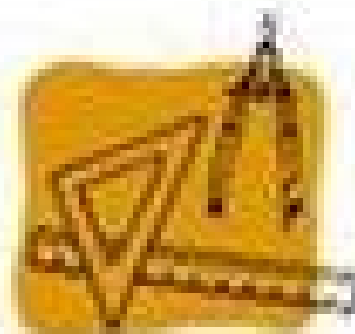
Engineering Method

Phase 1 Idea



- Identify problem

Phase 2 Concept



- Existing solutions
- Requirements
- Constraints

Phase 3 Planning



- Define objectives
- Plan program and schedule

Phase 4 Design



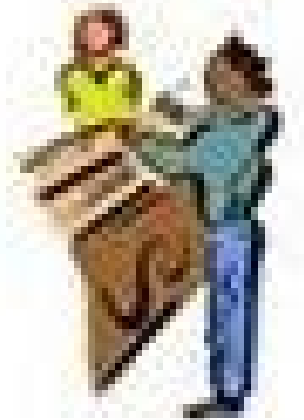
- Drawings
- Schematics
- Models
- Algorithms
- Proof of concept

Phase 5 Development



- Prototypes
- Experiments
- Validation and verification

Phase 6 Launch



- Results

Step 1
Ask A
Question

Step 2
Do
Background
Research

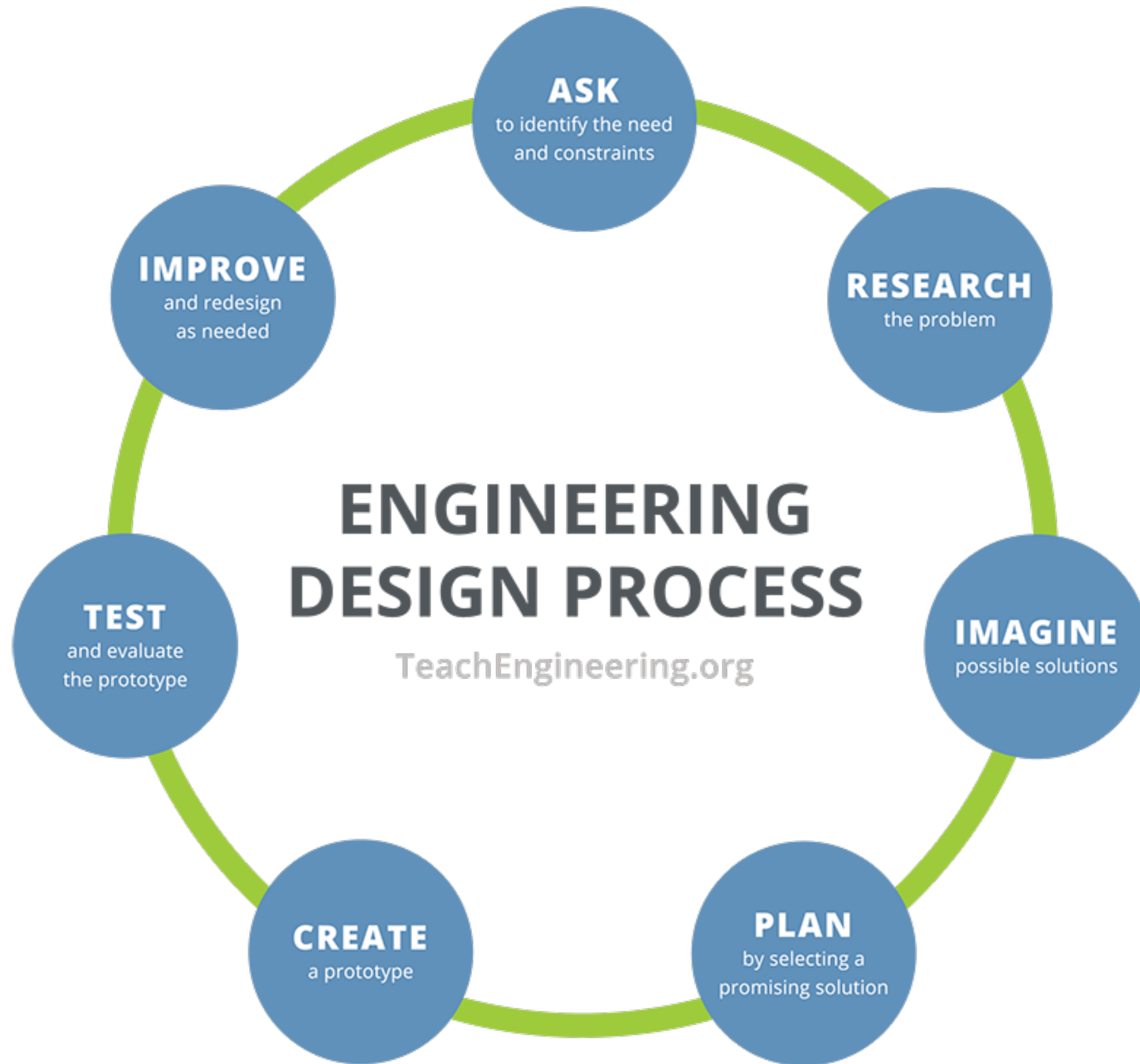
Step 3
Construct
A Hypothesis

Step 4
Test
Hypothesis

Step 5
Analyze Data &
Draw Conclusion

Step 6
Communicate

Scientific Method





Product Design Method

Stage 1 - Problem

1. Identify the problem - constrained.
2. Breakdown the facets of the problem. (Why is it a problem that hasn't been solved yet.)
3. Quantify the problem - how big of a problem is it.
4. What value could be provided by solving it

Desired Output - Agreement/Empathy



Product Design Method

Stage 2 - Solution

1. Break the problem down into smaller parts
2. Identify the inputs you would need
3. Come up with a logic to use the inputs to get an output
4. Format the output in the way you would like to see it .
5. Plan the mechanical design if applicable

Desired Output - Confidence, Trust & Perspective



Product Design Method

Stage 3 - Prototype

1. Identify sensors to collect the input
2. Come up with circuit diagram
3. Create and test circuit.
4. Plan and execute Mechanical aspects
5. Fabricate a scale model of the mechanical design .
6. Assemble the prototype
7. Test Prototype
8. Get Feedback

Desired Output - Confidence, Trust & Validation