	Name	Duration	Predecessors	Qtr 2, 2023	Qtr 3, 2023	Qtr 4, 2023	Qtr 1, 2024	Qtr 2, 202
				Apr May Jun	Jul Aug Sep	Oct Nov Dec	Jan Feb Mar	Apr May
1	**Specific Aim 1**	**260 days**						
2	**TCP Fabrication**	**60 days**						
3	Environment Setup	5 days						
4	Design TCP Machine	10 days	3SS					
5	Build TCP Machine	20 days	4					
6	TCP Creation	30 days	5					
7	Data Collection	30 days	6SS					
8	**Kinematic Modeling**	**100 days**	2					
9	Environment Setup	10 days						
10	Program Model Equations	50 days	9SS					
11	Model Comparisons (1)	40 days	10SS+2 weeks					
12	Program Tension Equations	50 days	11					
13	Model Comparisons (2)	40 days	12SS+2 weeks					
14	**Controller Design**	**100 days**	8					
15	Select Controller Type	10 days						
16	Program Single-strand Controller	20 days	15					
17	Test in Simulation	20 days	16					
18	Test in Physical System	20 days	17SS					
19	Program Multi-strand Controller	30 days	17;18					
20	Test in Simulation	20 days	19					
21	Test in Physical System	20 days	20SS					
22	**Specific Aim 2**	**260 days**						
23	**End Effector Design**	**120 days**						
24	Research Tubing Materials	30 days						
25	Internal Circuit Layout Planning	30 days	24SS					
26	Implementation	60 days	24;25					
27	Camera/Lighting Testing	30 days	26					
28	Flexibility Testing	30 days	27SS					
29	Dimension Testing	30 days	27SS					
30	**Core Tubing Design**	**60 days**	23					
31	Configuration Planning	10 days						
32	Connection Point Planning	10 days	31SS					
33	Implementation	40 days	31;32					
34	Flexibility Testing	10 days	33					
35	Dimension Testing	10 days	34SS					
36	**Connection Point Design**	**60 days**	30					
37	Locking Mechanism Research	10 days						
38	End Effector Planning	10 days	37					
39	Core Tubing Planning	10 days	38SS					
40	Implementation	20 days	38;39					
41	Durability Testing	20 days	40					
42	Circuit Testing	20 days	41SS					
43	Flexibility Testing	20 days	42SS					
44	**Open Period**	**20 days**	**43;42;41**					
45	Miscellaneous Tasks	20 days						
46	**Specific Aim 3**	**260 days**						
47	**Neural Network Retraining**	**110 days**						
48	Access to Medical Center Data	10 days						
49	Environment Setup	20 days	48					
50	Data Training	40 days	49					
51	Network Testing	40 days	50					
52	Network Changes	40 days	51SS					
53	**Hardware Integration**	**110 days**	47					
54	Environment Setup	20 days						
55	Configuration Planning	20 days	54					
56	Input and Output Planning	20 days	55SS					
57	Test Configuration Setup	30 days	56;55					
58	Integration Testing	40 days	57					
59	**Realtime Identification Testing**	**40 days**	53					
60	Network Testing (Simulation)	40 days						
61	Network Testing (Mannequin)	40 days	60SS					
62	Network Modification	20 days	61SS+1 month					

Complete Timeline