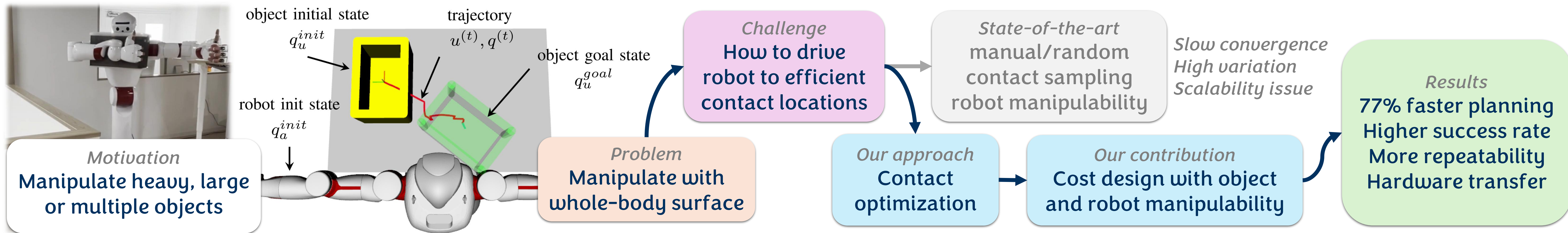


Multi-contact Optimization for Whole-body Dexterity

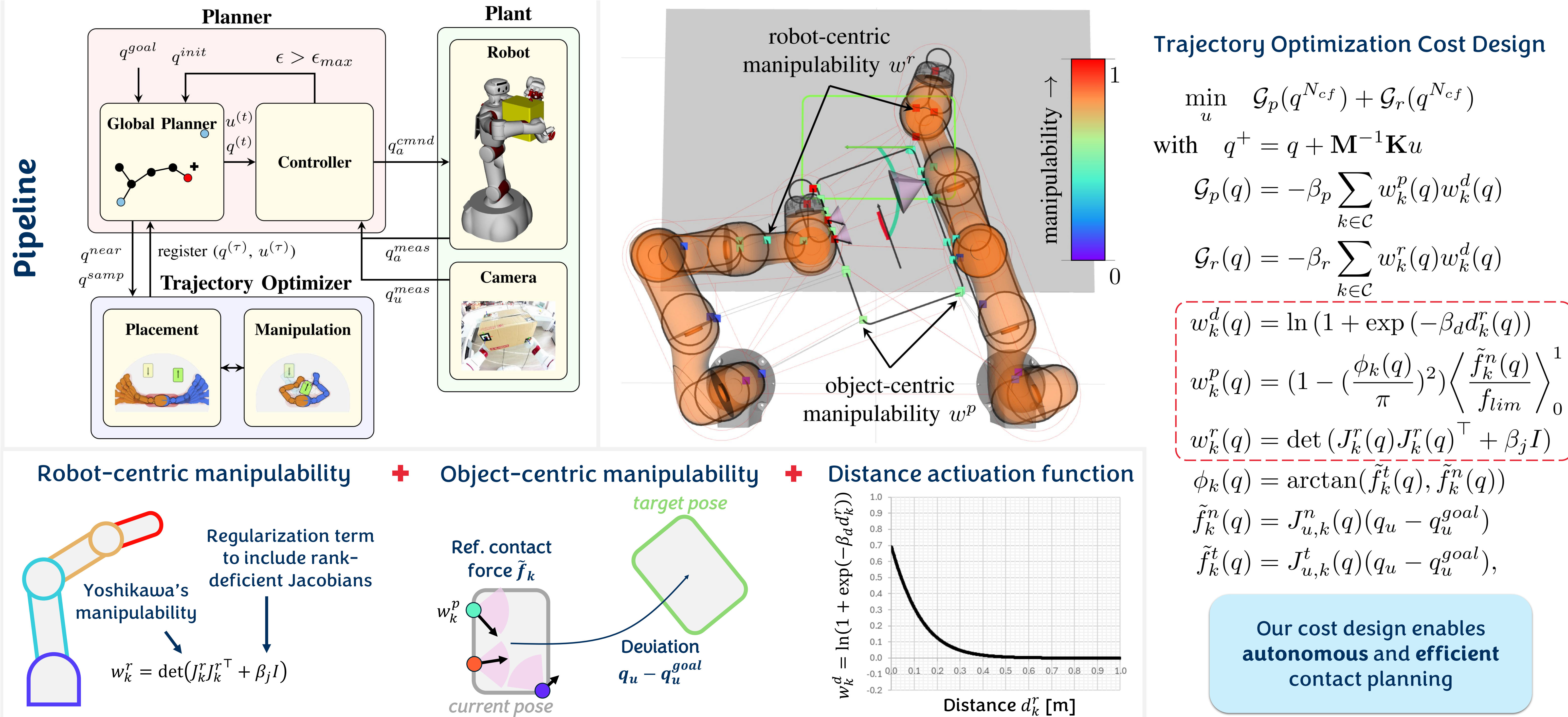
Dexterous Humanoid Manipulation Workshop

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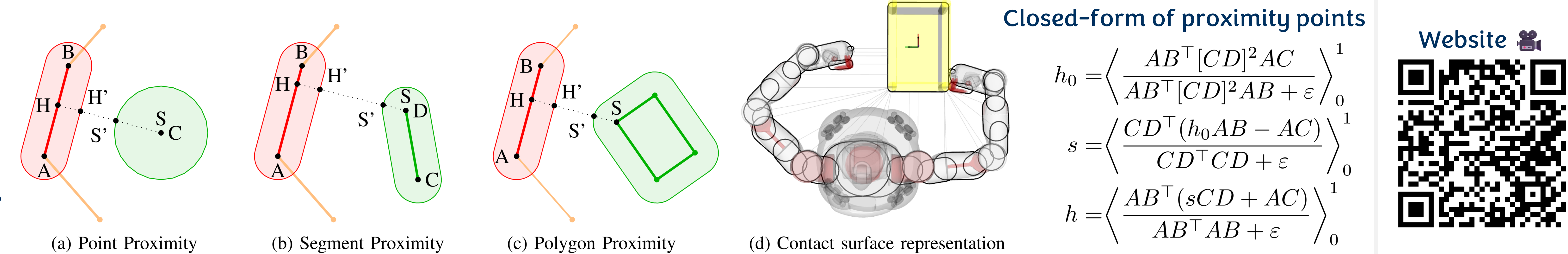
Overview



Method



Representation



Results

Planning time		Scenario 1					Scenario 2					Scenario 3		Scenario 4	
q_a^{init}	[deg]	-40.1, 0, 0, 40.1, 0, 0					0, 0, 0, 0, 0, 0					-45, 0, 0, -45, 0, 0		0, 0, 0, 0, 0, 0	
q_u^{init}	[m, m, deg]	0.60, -0.20, 0.00					0.65, 0.00, 0.00					0.50, -0.55, 0.00		0.40, 0.00, 0.00	
q_u^{goal}	[m, m, deg]	0.60, 0.20, θ					0.35, 0.00, θ					0.50, 0.55, -90.0		0.80, 0.00, 0.00	
θ	[deg]	0 45 90 135 180					0 45 90 135 180					-		-	
OURS	success ¹ [%]	100	100	100	100	93	100	100	100	100	100	100	100	100	100
	mean [mn]	1.2	1.9	5.7	6.5	16.0	0.5	0.4	5.3	7.8	5.3	5.6	5.6	2.6	2.6
	min [mn]	1.0	1.7	3.4	4.6	6.0	0.3	0.4	4.6	4.5	3.1	5.2	5.2	2.3	2.3
	max [mn]	1.3	2.1	11.2	10.1	-	0.7	0.5	8.1	12.5	12.9	6.1	6.1	2.7	2.7
Baseline ²	success ¹ [%]	100	70	7	0	0	93	40	33	7	0	100	100	20	20
	mean [mn]	3.9	13.5	29.1	-	-	9.7	20.9	22.7	28.7	-	15.2	15.2	27.9	27.9
	min [mn]	0.3	0.6	5.9	-	-	0.4	0.3	0.5	2.7	-	8.2	8.2	12.1	12.1
	max [mn]	26.1	-	-	-	-	-	-	-	-	-	21.4	21.4	-	-

Scenario 1

Scenario 2

**Plan 77% faster
Higher success
Less variation**

