

APPENDIX A

USER STUDY PARTICIPANTS

ID	Age	Gender	Ethnicity	Hair Length [mm]	NARS Scale [7-pt]
P1	26	Man	Asian	75	4.6
P2	22	Man	Latino	400	2.2
P3	24	Man	Asian	110	2.6
P4	25	Man	Latino	50	1.4
P5	27	Man	S Asian	100	3.2
P6	20	Man	Asian	80	4.2
P7	26	Woman	Asian	381	3.2
P8	27	Man	White	45	3.0
P9	24	Woman	Asian	400	3.2
P10	27	Man	S Asian	50	3.2
P11	25	Man	Asian	65	3.6
P12	25	Woman	Black	508	4.6

TABLE III: Demographic Data with NARS Scores

APPENDIX B

ADDITIONAL FORCE RESULTS

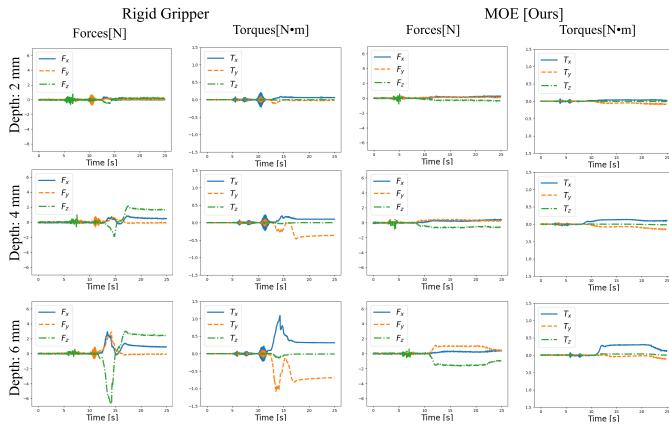


Fig. 12: **Full set of force and torque readings** for the comparison between a rigid gripper and proposed MOE.

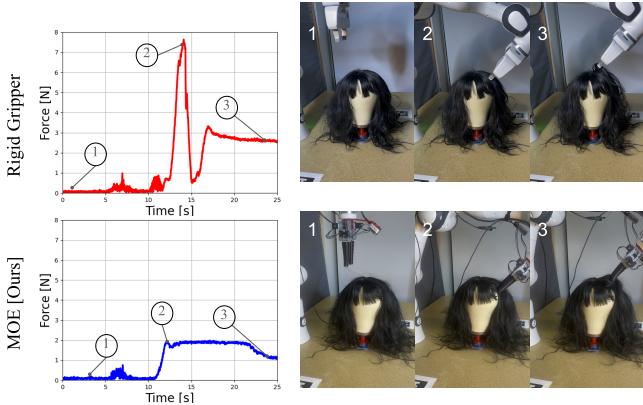


Fig. 13: Hair grasping task progression on a sensorized mannequin head.

APPENDIX C

QUESTIONNAIRE

Fig. 14: Pre-Study Questionnaire.

Task [Head Patting, Finger Combing, Hair Grasping]

Method 2

I felt comfortable during the interaction in terms of force/pressure.



The pressure and force applied by the robot felt consistent.



The robot performs reliably.



I can trust the robot to be safe.



The robot seems practical.



The robot was effective.



The robot was too forceful.



The robot performed the task successfully.



I was at ease during the interaction.



Fig. 15: Questionnaire given to participants after a trial with a system for a task.

After Both Methods

I was more comfortable with the first trial.



The robot in the first trial seemed more useful.



The force was more consistent in the first trial.

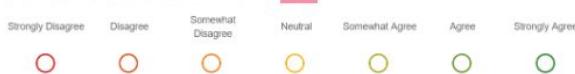


Fig. 16: Questionnaire given to participants after trials with both systems for a task.

**APPENDIX D
INSTITUTIONAL REVIEW**

The Institutional Review Board approved the protocol for the trials and the study (STUDY2023_00000502).