

Deep Learning-Empowered Single-Finger Tactile Device for Accessible Force/Position HCI in Upper-Limb Disabilities

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APPENDIX A

SFTID PRICE LIST

Part Name	Quantity	Unit Price (USD)	Total Price (USD)
Sensor Module	3	1.4	4.2
Microcontroller	1	10.9	10.9
Circuit Board	3	0.84	2.52
Top Plate	1	0.82	0.82
Bottom Plate	1	0.82	0.82
Base	1	0.4	0.4
Electrical Wire	1	0.6	0.6
Total Cost			20.26

APPENDIX B

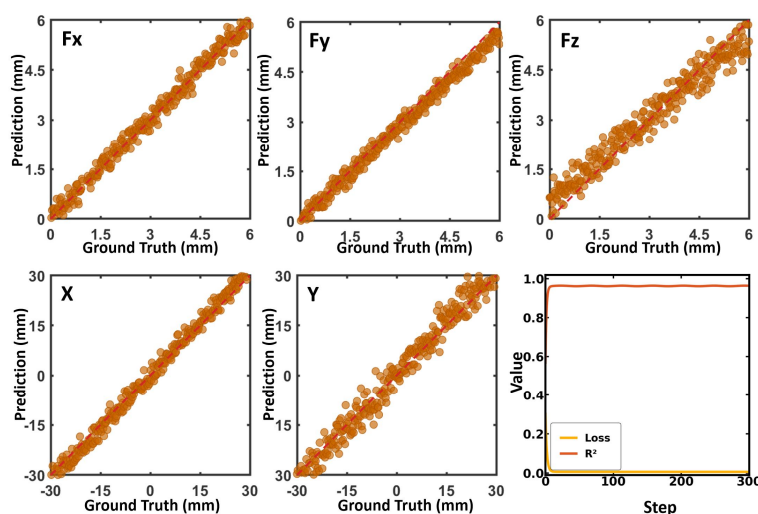


Fig. 6. Loss Function and MLP Training Performance with Regional Averages of Position and 3D Force in 12 Zones.









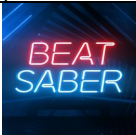
APPENDIX C

SIGNAL OUTPUTS AND TRANSMISSION CHARACTERISTICS OF THE THREE SENSORS

Coefficient	Sensor1	Sensor2	Sensor3	FEM-Sensor
Fx(N/ux)	794	808	799	629
Fy (N/ux)	864	819	863	649
Fz(N/ux)	276	329	278	331
Coef Fx	1.26	1.33	1.20	1.00
Coef Fy	1.28	1.26	1.00	1.00
Coef Fz	1.27	1.33	1.20	1.00

APPENDIX D

GAME CONTROL MAPPING WITH SFTID ADAPTATION

Game Genre	Controls	SFTID Adaption
 Super Mario	D-pad movement + button jump/attack	$\uparrow \downarrow \leftarrow \rightarrow + Fz$
 Tetris	D-pad rotation + quick drop	$\uparrow \downarrow \leftarrow \rightarrow + Fz$
 Tank Battle	Stick move + fire	$\uparrow \downarrow \leftarrow \rightarrow + Fz$
 Shot (Contra)	D-pad movement + button jump/attack	$\uparrow \downarrow \leftarrow \rightarrow + Fy + Fz$
 Fighting (Mortal Kombat)	D-pad + multi-button combos	$\uparrow \downarrow \leftarrow \rightarrow + Fz + \text{gesture combos}$
 Fighting (KOF'97)	D-pad + multi-button combos	$\uparrow \downarrow \leftarrow \rightarrow + Fz + \text{gesture combos}$
 Sport (FIFA)	Stick move + pass/shoot	$\uparrow \downarrow \leftarrow \rightarrow + Fz + \text{gesture combos}$
 FPS (Counter-Strike)	Mouse aim + move + fire	$\uparrow \downarrow \leftarrow \rightarrow + Fx, Fy, Fz + \text{gesture}$
 Rhythm (Beat Saber)	Motion swings + position tracking	position tracking + Fx, Fy, Fz hit control