

電気触覚ディスプレイを用いた円筒形マスタハンドの設計

○梶本 裕之 (電気通信大学/科学技術振興機構 さきがけ)

Design of Cylindrical Master Hand using Electrocutaneous Display

○Hiroyuki KAJIMOTO (The University of Electro-Communications, JST PRESTO)

Abstract: Precise manual work is frequently required in remote and virtual environment, such as tele-surgeries and VR training systems. Tactile feedback to the whole hand is one of the key elements to achieve this goal, but most haptic I/O systems for hand could present haptic sensation only to the tip of the fingers, due to the size limitation of the tactile display. We propose to use electrocutaneous display to construct the whole hand tactile feedback system. The electrocutaneous display can be made very thin while dense tactile presentation is possible

1.

CyberTouch [1]

2.

2.

CyberGrasp [2]

Rutgars Master

3

[3]

1. ()

HIRO [4]

2. ()

[5]

3. ()

[6]

3.

1.1. 先行研究

1.

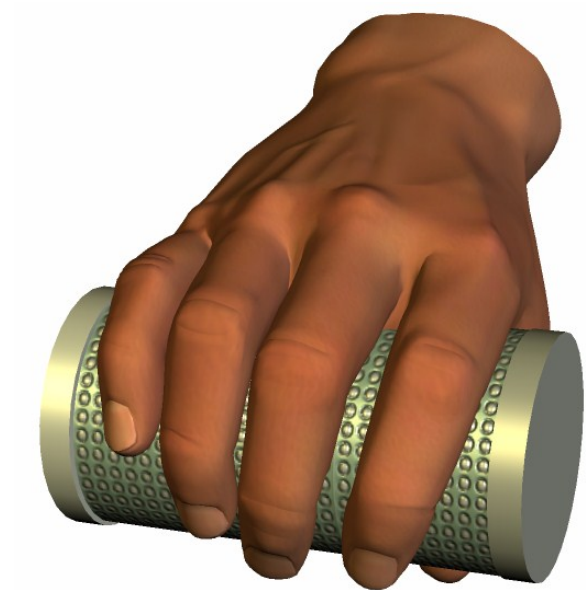
[7]

[8]

[10][11][12]

1.2. 円筒型マスタハンド

Fig. 1



Sato

MeisterGRIP[9]

MeisterGRIP

1.

2.

3.

MeisterGRIP

Fig. 1 Image of cylindrical master hand using electrocutaneous display.

2.

1.5mm

2mm

3mm

8mm

[13]

1.3. 電気触覚ディスプレイ

3mm

SuperTex HV507 [12] IC
 64ch IC
 64 Fig. 2 IC

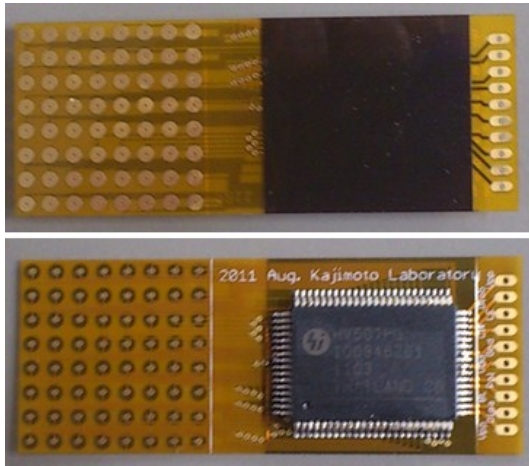


Fig. 2 Flexible electrode unit with 64 electrodes and 1 driver IC.

8
 $3\text{mm} \times 8 \times 8 = 192\text{mm}$
 61.1mm
 53mm
 66mm [14]
 $3\text{mm} \times 8 \times 4 = 96\text{mm}$
 77mm 95
 88.5mm
 [15]
 91.6mm [14]

Fig. 3



Fig. 3 Cylindrical shape by connecting flexible electrode units.

2.1. 駆動実験

8 3 24
 1536
 6 4 Fig. 4

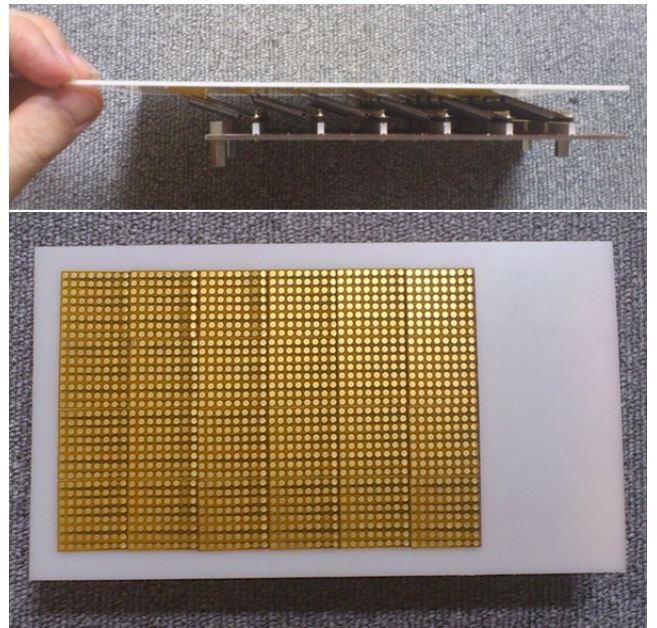


Fig. 4 Test environment with 24 units containing 1532 electrodes

1
 1 100us
 150ms 8Hz

3.

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