HANDi-Hand Assembly Manual

Dylan J. A. Brenneis
August 2020

Introduction

The HANDi Hand is an open-source robotic platform specifically designed for machine learning research in prosthetic control. The inexpensive and easily modifiable hardware allows versatility for research studies, and the suite of sensors provides valuable information for machine learning and prosthetics research.

The open-source release provides all solid-modelling files, .stl files, Arduino code, and assembly instruction required to construct a fully functional HANDi Hand, and should also give the maker enough flexibility to make alterations to the design as necessary to suit their own needs. Both left and right hand versions are available. To contact the original designers, or to receive support for your build, please visit BLINCdev.ca.

This assembly manual outlines all the information required to print and source parts, and assemble the HANDi Hand as currently designed. The hand takes an estimated 30 hours to build.

Contents

Introduction **ii**

Glossary of Terms **vi**

List of Tables

List of Figures

1 Numbering scheme used for finger naming. vi
2 Numbering scheme used for joint naming. vi

Glossary of Terms

Digits: The digits are referred to by standard numbering, beginning with the thumb as D1 as shown in Figure 1.

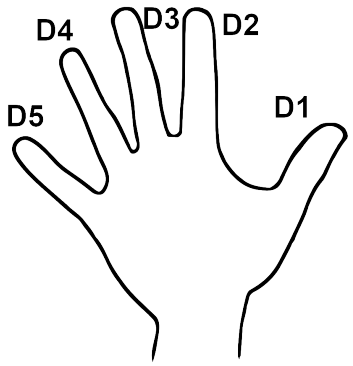

FIGURE 1: Numbering scheme used for finger naming.

Joints: The joints are named in accordance with Figure 2. The names are constructed first with a digit indicator (i.e. D2) followed by a joint indicator D, I or P, indicating distal, intermediate, or proximal respectively. Potentiometers are named for the joints that they measure. The digit D0 refers to thumb rotation.

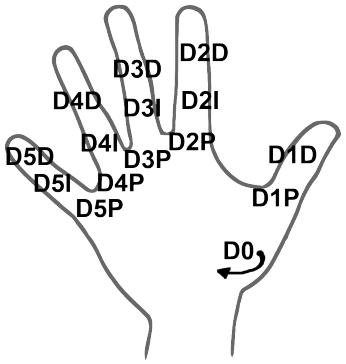

FIGURE 2: Numbering scheme used for joint naming.

Finger Parts: Each phalanx of the finger is made up of multiple parts. The part names are contrived according to the following convention:

1. Phalanx indicator. PP = Proximal Phalanx, IP = Intermediate Phalanx, DP = Distal Phalanx, MC = Metacarpal
2. Part position indicator. P = Proximal, D = Distal
3. Position modifier. There are sometimes multiple parts in the same location that must be differentiated by their function (pivot, main, lock, tip, etc).
4. Handedness indicator. R = Right Hand, L = Left Hand

An example part name would be **IP-P Pivot R**, for the proximal portion of the intermediate phalanx corresponding to the pivot, for the right-hand version of the HANDi Hand.