

# MANUS CSV Header Reference

MANUS Core 2.2

## Frame & Time

### **Frame**

Number of frame

### **Elapsed\_Time\_In\_Milliseconds**

Amount of milliseconds elapsed since the beginning of the exported recording.

### **Time**

Time based on the beginning of the exported recording.

# Joint Positions

## Wrist

**Hand\_X, Hand\_Y, Hand\_Z**

World space (absolute) positions of the wrist joint on the X, Y and Z axis.

## Thumb

**Thumb\_CMC\_X, Thumb\_CMC\_Y, Thumb\_CMC\_Z**

World space (absolute) positions of the thumb carpometacarpal joint on the X, Y and Z axis.

**Thumb\_MCP\_X, Thumb\_MCP\_Y, Thumb\_MCP\_Z**

World space (absolute) positions of the thumb metacarpophalangeal joint on the X, Y and Z axis.

**Thumb\_DIP\_X, Thumb\_DIP\_Y, Thumb\_DIP\_Z**

World space (absolute) positions of the thumb interphalangeal joint on the X, Y and Z axis.

**Thumb\_TIP\_X, Thumb\_TIP\_Y, Thumb\_TIP\_Z**

World space (absolute) positions of the thumb fingertip on the X, Y and Z axis.

## Index Finger

**Index\_CMC\_X, Index\_CMC\_Y, Index\_CMC\_Z**

World space (absolute) positions of the index carpometacarpal joint on the X, Y and Z axis.

**Index\_MCP\_X, Index\_MCP\_Y, Index\_MCP\_Z**

World space (absolute) positions of the index metacarpophalangeal joint on the X, Y and Z axis.

**Index\_PIP\_X, Index\_PIP\_Y, Index\_PIP\_Z**

World space (absolute) positions of the index proximal interphalangeal joint on the X, Y and Z axis.

### **Index\_DIP\_X, Index\_DIP\_Y, Index\_DIP\_Z**

World space (absolute) positions of the index distal interphalangeal joint on the X, Y and Z axis.

### **Index\_TIP\_X, Index\_TIP\_Y, Index\_TIP\_Z**

World space (absolute) positions of the index fingertip on the X, Y and Z axis.

## **Middle Finger**

### **Middle\_CMC\_X, Middle\_CMC\_Y, Middle\_CMC\_Z**

World space (absolute) positions of the middle carpometacarpal joint on the X, Y and Z axis.

### **Middle\_MCP\_X, Middle\_MCP\_Y, Middle\_MCP\_Z**

World space (absolute) positions of the middle metacarpophalangeal joint on the X, Y and Z axis.

### **Middle\_PIP\_X, Middle\_PIP\_Y, Middle\_PIP\_Z**

World space (absolute) positions of the middle proximal interphalangeal joint on the X, Y and Z axis.

### **Middle\_DIP\_X, Middle\_DIP\_Y, Middle\_DIP\_Z**

World space (absolute) positions of the middle distal interphalangeal joint on the X, Y and Z axis.

### **Middle\_TIP\_X, Middle\_TIP\_Y, Middle\_TIP\_Z**

World space (absolute) positions of the middle fingertip on the X, Y and Z axis.

## **Ring Finger**

### **Ring\_CMC\_X, Ring\_CMC\_Y, Ring\_CMC\_Z**

World space (absolute) positions of the ring carpometacarpal joint on the X, Y and Z axis.

### **Ring\_MCP\_X, Ring\_MCP\_Y, Ring\_MCP\_Z**

World space (absolute) positions of the ring metacarpophalangeal joint on the X, Y and Z axis.

### **Ring\_PIP\_X, Ring\_PIP\_Y, Ring\_PIP\_Z**

World space (absolute) positions of the ring proximal interphalangeal joint on the X, Y and Z axis.

### **Ring\_DIP\_X, Ring\_DIP\_Y, Ring\_DIP\_Z**

World space (absolute) positions of the ring distal interphalangeal joint on the X, Y and Z axis.

### **Ring\_TIP\_X, Ring\_TIP\_Y, Ring\_TIP\_Z**

World space (absolute) positions of the ring fingertip on the X, Y and Z axis.

## **Pinky Finger**

### **Pinky\_CMC\_X, Pinky\_CMC\_Y, Pinky\_CMC\_Z**

World space (absolute) positions of the pinky carpometacarpal joint on the X, Y and Z axis.

### **Pinky\_MCP\_X, Pinky\_MCP\_Y, Pinky\_MCP\_Z**

World space (absolute) positions of the pinky metacarpophalangeal joint on the X, Y and Z axis.

### **Pinky\_PIP\_X, Pinky\_PIP\_Y, Pinky\_PIP\_Z**

World space (absolute) positions of the pinky proximal interphalangeal joint on the X, Y and Z axis.

### **Pinky\_DIP\_X, Pinky\_DIP\_Y, Pinky\_DIP\_Z**

World space (absolute) positions of the pinky distal interphalangeal joint on the X, Y and Z axis.

### **Pinky\_TIP\_X, Pinky\_TIP\_Y, Pinky\_TIP\_Z**

World space (absolute) positions of the pinky fingertip on the X, Y and Z axis.

# Joint Rotations

## Wrist

**Hand\_X, Hand\_Y, Hand\_Z, (Hand\_W)**

World space (absolute) rotations of the wrist joint on the X, Y, Z (and W) axis.

## Thumb

**Thumb\_CMC\_X, Thumb\_CMC\_Y, Thumb\_CMC\_Z, (Thumb\_CMC\_W)**

World space (absolute) positions of the thumb carpometacarpal joint on the X, Y, Z (and W) axis.

**Thumb\_MCP\_X, Thumb\_MCP\_Y, Thumb\_MCP\_Z, (Thumb\_MCP\_W)**

World space (absolute) positions of the thumb metacarpophalangeal joint on the X, Y, Z (and W) axis.

**Thumb\_DIP\_X, Thumb\_DIP\_Y, Thumb\_DIP\_Z, (Thumb\_DIP\_W)**

World space (absolute) positions of the thumb interphalangeal joint on the X, Y, Z (and W) axis.

**Thumb\_TIP\_X, Thumb\_TIP\_Y, Thumb\_TIP\_Z, (Thumb\_TIP\_W)**

World space (absolute) positions of the thumb fingertip on the X, Y, Z (and W) axis.

## Index Finger

**Index\_CMC\_X, Index\_CMC\_Y, Index\_CMC\_Z, (Index\_CMC\_W)**

World space (absolute) positions of the index carpometacarpal joint on the X, Y, Z (and W) axis.

**Index\_MCP\_X, Index\_MCP\_Y, Index\_MCP\_Z, (Index\_MCP\_W)**

World space (absolute) positions of the index metacarpophalangeal joint on the X, Y, Z (and W) axis.

**Index\_PIP\_X, Index\_PIP\_Y, Index\_PIP\_Z, (Index\_PIP\_W)**

World space (absolute) positions of the index proximal interphalangeal joint on the X, Y, Z (and W) axis.

### **Index\_DIP\_X, Index\_DIP\_Y, Index\_DIP\_Z, (Index\_DIP\_W)**

World space (absolute) positions of the index distal interphalangeal joint on the X, Y, Z (and W) axis.

### **Index\_TIP\_X, Index\_TIP\_Y, Index\_TIP\_Z, (Index\_TIP\_W)**

World space (absolute) positions of the index fingertip on the X, Y, Z (and W) axis.

## **Middle Finger**

### **Middle\_CMC\_X, Middle\_CMC\_Y, Middle\_CMC\_Z, (Middle\_CMC\_W)**

World space (absolute) positions of the middle carpometacarpal joint on the X, Y, Z (and W) axis.

### **Middle\_MCP\_X, Middle\_MCP\_Y, Middle\_MCP\_Z, (Middle\_MCP\_W)**

World space (absolute) positions of the middle metacarpophalangeal joint on the X, Y, Z (and W) axis.

### **Middle\_PIP\_X, Middle\_PIP\_Y, Middle\_PIP\_Z, (Middle\_PIP\_W)**

World space (absolute) positions of the middle proximal interphalangeal joint on the X, Y, Z (and W) axis.

### **Middle\_DIP\_X, Middle\_DIP\_Y, Middle\_DIP\_Z, (Middle\_DIP\_W)**

World space (absolute) positions of the middle distal interphalangeal joint on the X, Y, Z (and W) axis.

### **Middle\_TIP\_X, Middle\_TIP\_Y, Middle\_TIP\_Z, (Middle\_TIP\_W)**

World space (absolute) positions of the middle fingertip on the X, Y, Z (and W) axis.

## **Ring Finger**

### **Ring\_CMC\_X, Ring\_CMC\_Y, Ring\_CMC\_Z, (Ring\_CMC\_W)**

World space (absolute) positions of the ring carpometacarpal joint on the X, Y, Z (and W) axis.

### **Ring\_MCP\_X, Ring\_MCP\_Y, Ring\_MCP\_Z, (Ring\_MCP\_W)**

World space (absolute) positions of the ring metacarpophalangeal joint on the X, Y, Z (and W) axis.

### **Ring\_PIP\_X, Ring\_PIP\_Y, Ring\_PIP\_Z, (Ring\_PIP\_W)**

World space (absolute) positions of the ring proximal interphalangeal joint on the X, Y, Z (and W) axis.

### **Ring\_DIP\_X, Ring\_DIP\_Y, Ring\_DIP\_Z, (Ring\_DIP\_W)**

World space (absolute) positions of the ring distal interphalangeal joint on the X, Y, Z (and W) axis.

### **Ring\_TIP\_X, Ring\_TIP\_Y, Ring\_TIP\_Z, (Ring\_TIP\_W)**

World space (absolute) positions of the ring fingertip on the X, Y, Z (and W) axis.

## **Pinky Finger**

### **Pinky\_CMC\_X, Pinky\_CMC\_Y, Pinky\_CMC\_Z, (Pinky\_CMC\_W)**

World space (absolute) positions of the pinky carpometacarpal joint on the X, Y, Z (and W) axis.

### **Pinky\_MCP\_X, Pinky\_MCP\_Y, Pinky\_MCP\_Z, (Pinky\_MCP\_W)**

World space (absolute) positions of the pinky metacarpophalangeal joint on the X, Y, Z (and W) axis.

### **Pinky\_PIP\_X, Pinky\_PIP\_Y, Pinky\_PIP\_Z, (Pinky\_PIP\_W)**

World space (absolute) positions of the pinky proximal interphalangeal joint on the X, Y, Z (and W) axis.

### **Pinky\_DIP\_X, Pinky\_DIP\_Y, Pinky\_DIP\_Z, (Pinky\_DIP\_W)**

World space (absolute) positions of the pinky distal interphalangeal joint on the X, Y, Z (and W) axis.

### **Pinky\_TIP\_X, Pinky\_TIP\_Y, Pinky\_TIP\_Z, (Pinky\_TIP\_W)**

World space (absolute) positions of the pinky fingertip on the X, Y, Z (and W) axis.

# Positional Joint Velocity

## Wrist

**Hand\_Velocity\_X, Hand\_Velocity\_Y, Hand\_Velocity\_Z**

Positional velocity in unit / second of the wrist joint on the X, Y and Z axis.

## Thumb

**Thumb\_CMC\_Velocity\_X, Thumb\_CMC\_Velocity\_Y, Thumb\_CMC\_Velocity\_Z**

Positional velocity in unit / second of the thumb carpometacarpal joint on the X, Y and Z axis.

**Thumb\_MCP\_Velocity\_X, Thumb\_MCP\_Velocity\_Y, Thumb\_MCP\_Velocity\_Z**

Positional velocity in unit / second of the thumb metacarpophalangeal joint on the X, Y and Z axis.

**Thumb\_DIP\_Velocity\_X, Thumb\_DIP\_Velocity\_Y, Thumb\_DIP\_Velocity\_Z**

Positional velocity in unit / second of the thumb interphalangeal joint on the X, Y and Z axis.

**Thumb\_TIP\_Velocity\_X, Thumb\_TIP\_Velocity\_Y, Thumb\_TIP\_Velocity\_Z**

Positional velocity in unit / second of the thumb fingertip on the X, Y and Z axis.

## Index Finger

**Index\_CMC\_Velocity\_X, Index\_CMC\_Velocity\_Y, Index\_CMC\_Velocity\_Z**

Positional velocity in unit / second of the index carpometacarpal joint on the X, Y and Z axis.

**Index\_MCP\_Velocity\_X, Index\_MCP\_Velocity\_Y, Index\_MCP\_Velocity\_Z**

Positional velocity in unit / second of the index metacarpophalangeal joint on the X, Y and Z axis.

**Index\_PIP\_Velocity\_X, Index\_PIP\_Velocity\_Y, Index\_PIP\_Velocity\_Z**

Positional velocity in unit / second of the index proximal interphalangeal joint on the X, Y and Z axis.



### **Index\_DIP\_Velocity\_X, Index\_DIP\_Velocity\_Y, Index\_DIP\_Velocity\_Z**

Positional velocity in unit / second of the index distal interphalangeal joint on the X, Y and Z axis.

### **Index\_TIP\_Velocity\_X, Index\_TIP\_Velocity\_Y, Index\_TIP\_Velocity\_Z**

Positional velocity in unit / second of the index fingertip on the X, Y and Z axis.

## **Middle Finger**

### **Middle\_CMC\_Velocity\_X, Middle\_CMC\_Velocity\_Y, Middle\_CMC\_Velocity\_Z**

Positional velocity in unit / second of the middle carpometacarpal joint on the X, Y and Z axis.

### **Middle\_MCP\_Velocity\_X, Middle\_MCP\_Velocity\_Y, Middle\_MCP\_Velocity\_Z**

Positional velocity in unit / second of the middle metacarpophalangeal joint on the X, Y and Z axis.

### **Middle\_PIP\_Velocity\_X, Middle\_PIP\_Velocity\_Y, Middle\_PIP\_Velocity\_Z**

Positional velocity in unit / second of the middle proximal interphalangeal joint on the X, Y and Z axis.

### **Middle\_DIP\_Velocity\_X, Middle\_DIP\_Velocity\_Y, Middle\_DIP\_Velocity\_Z**

Positional velocity in unit / second of the middle distal interphalangeal joint on the X, Y and Z axis.

### **Middle\_TIP\_Velocity\_X, Middle\_TIP\_Velocity\_Y, Middle\_TIP\_Velocity\_Z**

Positional velocity in unit / second of the middle fingertip on the X, Y and Z axis.

## **Ring Finger**

### **Ring\_CMC\_Velocity\_X, Ring\_CMC\_Velocity\_Y, Ring\_CMC\_Velocity\_Z**

Positional velocity in unit / second of the ring carpometacarpal joint on the X, Y and Z axis.

### **Ring\_MCP\_Velocity\_X, Ring\_MCP\_Velocity\_Y, Ring\_MCP\_Velocity\_Z**

Positional velocity in unit / second of the ring metacarpophalangeal joint on the X, Y and Z axis.

### **Ring\_PIP\_Velocity\_X, Ring\_PIP\_Velocity\_Y, Ring\_PIP\_Velocity\_Z**

Positional velocity in unit / second of the ring proximal interphalangeal joint on the X, Y and Z axis.

### **Ring\_DIP\_Velocity\_X, Ring\_DIP\_Velocity\_Y, Ring\_DIP\_Velocity\_Z**

Positional velocity in unit / second of the ring distal interphalangeal joint on the X, Y and Z axis.

### **Ring\_TIP\_Velocity\_X, Ring\_TIP\_Velocity\_Y, Ring\_TIP\_Velocity\_Z**

Positional velocity in unit / second of the ring fingertip on the X, Y and Z axis.

## **Pinky Finger**

### **Pinky\_CMC\_Velocity\_X, Pinky\_CMC\_Velocity\_Y, Pinky\_CMC\_Velocity\_Z**

Positional velocity in unit / second of the pinky carpometacarpal joint on the X, Y and Z axis.

### **Pinky\_MCP\_Velocity\_X, Pinky\_MCP\_Velocity\_Y, Pinky\_MCP\_Velocity\_Z**

Positional velocity in unit / second of the pinky metacarpophalangeal joint on the X, Y and Z axis.

### **Pinky\_PIP\_Velocity\_X, Pinky\_PIP\_Velocity\_Y, Pinky\_PIP\_Velocity\_Z**

Positional velocity in unit / second of the pinky proximal interphalangeal joint on the X, Y and Z axis.

### **Pinky\_DIP\_Velocity\_X, Pinky\_DIP\_Velocity\_Y, Pinky\_DIP\_Velocity\_Z**

Positional velocity in unit / second of the pinky distal interphalangeal joint on the X, Y and Z axis.

### **Pinky\_TIP\_Velocity\_X, Pinky\_TIP\_Velocity\_Y, Pinky\_TIP\_Velocity\_Z**

Positional velocity in unit / second of the pinky fingertip on the X, Y and Z axis.

# Positional Joint Acceleration

## Wrist

**Hand\_Acceleration\_X, Hand\_Acceleration\_Y, Hand\_Acceleration\_Z**

## Thumb

**Thumb\_CMC\_Acceleration\_X, Thumb\_CMC\_Acceleration\_Y, Thumb\_CMC\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the thumb carpometacarpal joint on the X, Y and Z axis.

**Thumb\_MCP\_Acceleration\_X, Thumb\_MCP\_Acceleration\_Y, Thumb\_MCP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the wrist joint on the X, Y and Z axis.

Positional acceleration in unit / second<sup>2</sup> of the thumb metacarpophalangeal joint on the X, Y and Z axis.

**Thumb\_DIP\_Acceleration\_X, Thumb\_DIP\_Acceleration\_Y, Thumb\_DIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the thumb interphalangeal joint on the X, Y and Z axis.

**Thumb\_TIP\_Acceleration\_X, Thumb\_TIP\_Acceleration\_Y, Thumb\_TIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the thumb fingertip on the X, Y and Z axis.

## Index Finger

**Index\_CMC\_Acceleration\_X, Index\_CMC\_Acceleration\_Y, Index\_CMC\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the index carpometacarpal joint on the X, Y and Z axis.

**Index\_MCP\_Acceleration\_X, Index\_MCP\_Acceleration\_Y, Index\_MCP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the index metacarpophalangeal joint on the X, Y and Z axis.

### **Index\_PIP\_Acceleration\_X, Index\_PIP\_Acceleration\_Y, Index\_PIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the index proximal interphalangeal joint on the X, Y and Z axis.

### **Index\_DIP\_Acceleration\_X, Index\_DIP\_Acceleration\_Y, Index\_DIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the index distal interphalangeal joint on the X, Y and Z axis.

### **Index\_TIP\_Acceleration\_X, Index\_TIP\_Acceleration\_Y, Index\_TIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the index fingertip on the X, Y and Z axis.

## **Middle Finger**

### **Middle\_CMC\_Acceleration\_X, Middle\_CMC\_Acceleration\_Y, Middle\_CMC\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the middle carpometacarpal joint on the X, Y and Z axis.

### **Middle\_MCP\_Acceleration\_X, Middle\_MCP\_Acceleration\_Y, Middle\_MCP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the middle metacarpophalangeal joint on the X, Y and Z axis.

### **Middle\_PIP\_Acceleration\_X, Middle\_PIP\_Acceleration\_Y, Middle\_PIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the middle proximal interphalangeal joint on the X, Y and Z axis.

### **Middle\_DIP\_Acceleration\_X, Middle\_DIP\_Acceleration\_Y, Middle\_DIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the middle distal interphalangeal joint on the X, Y and Z axis.

### **Middle\_TIP\_Acceleration\_X, Middle\_TIP\_Acceleration\_Y, Middle\_TIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the middle fingertip on the X, Y and Z axis.

## Ring Finger

### **Ring\_CMC\_Acceleration\_X, Ring\_CMC\_Acceleration\_Y, Ring\_CMC\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the ring carpometacarpal joint on the X, Y and Z axis.

### **Ring\_MCP\_Acceleration\_X, Ring\_MCP\_Acceleration\_Y, Ring\_MCP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the ring metacarpophalangeal joint on the X, Y and Z axis.

### **Ring\_PIP\_Acceleration\_X, Ring\_PIP\_Acceleration\_Y, Ring\_PIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the ring proximal interphalangeal joint on the X, Y and Z axis.

### **Ring\_DIP\_Acceleration\_X, Ring\_DIP\_Acceleration\_Y, Ring\_DIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the ring distal interphalangeal joint on the X, Y and Z axis.

### **Ring\_TIP\_Acceleration\_X, Ring\_TIP\_Acceleration\_Y, Ring\_TIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the ring fingertip on the X, Y and Z axis.

## Pinky Finger

### **Pinky\_CMC\_Acceleration\_X, Pinky\_CMC\_Acceleration\_Y, Pinky\_CMC\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the pinky carpometacarpal joint on the X, Y and Z axis.

### **Pinky\_MCP\_Acceleration\_X, Pinky\_MCP\_Acceleration\_Y, Pinky\_MCP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the pinky metacarpophalangeal joint on the X, Y and Z axis.

### **Pinky\_PIP\_Acceleration\_X, Pinky\_PIP\_Acceleration\_Y, Pinky\_PIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the pinky proximal interphalangeal joint on the X, Y and Z axis.

**Pinky\_DIP\_Acceleration\_X, Pinky\_DIP\_Acceleration\_Y, Pinky\_DIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the pinky distal interphalangeal joint on the X, Y and Z axis.

**Pinky\_TIP\_Acceleration\_X, Pinky\_TIP\_Acceleration\_Y, Pinky\_TIP\_Acceleration\_Z**

Positional acceleration in unit / second<sup>2</sup> of the pinky fingertip on the X, Y and Z axis.

# Pinch Distances

## **Pinch\_ThumbToIndex**

Distance in units between the thumb fingertip and the index finger fingertip.

## **Pinch\_ThumbToMiddle**

Distance in units between the thumb fingertip and the middle finger fingertip.

## **Pinch\_ThumbToRing**

Distance in units between the thumb fingertip and the ring finger fingertip.

## **Pinch\_ThumbToPinky**

Distance in units between the thumb fingertip and the pinky finger fingertip.

# Joint Angles

## Thumb

### **Thumb\_CMC\_Spread**

Joint angle (abduction or adduction, i.e. splaying) of the thumb carpometacarpal joint in degrees.

### **Thumb\_CMC\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the thumb carpometacarpal joint in degrees.

### **Thumb\_PIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the thumb metacarpophalangeal joint in degrees.

### **Thumb\_DIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the thumb interphalangeal joint in degrees.

## Index Finger

### **Index\_MCP\_Spread**

Joint angle (abduction or adduction, i.e. splaying) of the index metacarpophalangeal joint in degrees.

### **Index\_MCP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the index metacarpophalangeal joint in degrees.

### **Index\_PIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the index proximal interphalangeal joint in degrees.



### **Index\_DIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the index distal interphalangeal joint in degrees.

## **Middle Finger**

### **Middle\_MCP\_Spread**

Joint angle (abduction or adduction, i.e. splaying) of the middle metacarpophalangeal joint in degrees.

### **Middle\_MCP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the middle metacarpophalangeal joint in degrees.

### **Middle\_PIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the middle proximal interphalangeal joint in degrees.

### **Middle\_DIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the middle distal interphalangeal joint in degrees.

## **Ring Finger**

### **Ring\_MCP\_Spread**

Joint angle (abduction or adduction, i.e. splaying) of the ring metacarpophalangeal joint in degrees.

### **Ring\_MCP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the ring metacarpophalangeal joint in degrees.

### **Ring\_PIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the ring proximal interphalangeal joint in degrees.

### **Ring\_DIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the ring distal interphalangeal joint in degrees.

## **Pinky Finger**

### **Pinky\_MCP\_Spread**

Joint angle (abduction or adduction, i.e. splaying) of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_MCP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_PIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the pinky proximal interphalangeal joint in degrees.

### **Pinky\_DIP\_Flex**

Joint angle (flexion or (hyper)extension, i.e. bending) of the pinky distal interphalangeal joint in degrees.

# Joint Angular Velocity

## Thumb

### **Thumb\_CMC\_Spread\_AngularVelocity**

Angular velocity (abduction or adduction, i.e. splaying) in degrees / second of the thumb carpometacarpal joint.

### **Thumb\_CMC\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the thumb carpometacarpal joint.

### **Thumb\_PIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the thumb metacarpophalangeal joint in degrees.

### **Thumb\_DIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the thumb interphalangeal joint in degrees.

## Index Finger

### **Index\_MCP\_Spread\_AngularVelocity**

Angular velocity (abduction or adduction, i.e. splaying) in degrees / second of the index metacarpophalangeal joint in degrees.

### **Index\_MCP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the index metacarpophalangeal joint in degrees.

### **Index\_PIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the index proximal interphalangeal joint in degrees.

### **Index\_DIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the index distal interphalangeal joint in degrees.

## **Middle Finger**

### **Middle\_MCP\_Spread\_AngularVelocity**

Angular velocity (abduction or adduction, i.e. splaying) in degrees / second of the middle metacarpophalangeal joint in degrees.

### **Middle\_MCP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the middle metacarpophalangeal joint in degrees.

### **Middle\_PIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the middle proximal interphalangeal joint in degrees.

### **Middle\_DIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the middle distal interphalangeal joint in degrees.

## **Ring Finger**

### **Ring\_MCP\_Spread\_AngularVelocity**

Angular velocity (abduction or adduction, i.e. splaying) in degrees / second of the ring metacarpophalangeal joint in degrees.

### **Ring\_MCP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the ring metacarpophalangeal joint in degrees.

### **Ring\_PIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the ring proximal interphalangeal joint in degrees.

### **Ring\_DIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the ring distal interphalangeal joint in degrees.

## **Pinky Finger**

### **Pinky\_MCP\_Spread\_AngularVelocity**

Angular velocity (abduction or adduction, i.e. splaying) in degrees / second of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_MCP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_PIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the pinky proximal interphalangeal joint in degrees.

### **Pinky\_DIP\_Flex\_AngularVelocity**

Angular velocity (flexion or (hyper)extension, i.e. bending) in degrees / second of the pinky distal interphalangeal joint in degrees.

# Joint Angular Acceleration

## Thumb

### **Thumb\_CMC\_Spread\_AngularAcceleration**

Angular acceleration (abduction or adduction, i.e. splaying) in degrees / second<sup>2</sup> of the thumb carpometacarpal joint.

### **Thumb\_CMC\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the thumb carpometacarpal joint.

### **Thumb\_PIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the thumb metacarpophalangeal joint in degrees.

### **Thumb\_DIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the thumb interphalangeal joint in degrees.

## Index Finger

### **Index\_MCP\_Spread\_AngularAcceleration**

Angular acceleration (abduction or adduction, i.e. splaying) in degrees / second<sup>2</sup> of the index metacarpophalangeal joint in degrees.

### **Index\_MCP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the index metacarpophalangeal joint in degrees.

### **Index\_PIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the index proximal interphalangeal joint in degrees.

### **Index\_DIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the index distal interphalangeal joint in degrees.

## **Middle Finger**

### **Middle\_MCP\_Spread\_AngularAcceleration**

Angular acceleration (abduction or adduction, i.e. splaying) in degrees / second<sup>2</sup> of the middle metacarpophalangeal joint in degrees.

### **Middle\_MCP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the middle metacarpophalangeal joint in degrees.

### **Middle\_PIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the middle proximal interphalangeal joint in degrees.

### **Middle\_DIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the middle distal interphalangeal joint in degrees.

## **Ring Finger**

### **Ring\_MCP\_Spread\_AngularAcceleration**

Angular acceleration (abduction or adduction, i.e. splaying) in degrees / second<sup>2</sup> of the ring metacarpophalangeal joint in degrees.

### **Ring\_MCP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the ring metacarpophalangeal joint in degrees.

### **Ring\_PIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the ring proximal interphalangeal joint in degrees.

### **Ring\_DIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the ring distal interphalangeal joint in degrees.

## **Pinky Finger**

### **Pinky\_MCP\_Spread\_AngularAcceleration**

Angular acceleration (abduction or adduction, i.e. splaying) in degrees / second<sup>2</sup> of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_MCP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the pinky metacarpophalangeal joint in degrees.

### **Pinky\_PIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the pinky proximal interphalangeal joint in degrees.

### **Pinky\_DIP\_Flex\_AngularAcceleration**

Angular acceleration (flexion or (hyper)extension, i.e. bending) in degrees / second<sup>2</sup> of the pinky distal interphalangeal joint in degrees.