## Drift correction steps

**Step 1: Apply optical flow.**

contains [x,y] positions of fascicle (or ROI) points, is the optical flow field.

**Step 2: Estimate drift.**

is the estimated drift. is a trigonometry function that transforms from state to measurement, is the measurement from TimTrack.

**Step 3: Correct drift.**

is the state estimate, which is propagated to the next iteration (where it appears as is the inverse trigonometry function that transforms from measurement to state.

## Details

contains the horizontal and vertical coordinates of the superficial (s) and deep (d) aponeurosis fascicle attachment points.

contains the superficial aponeurosis attachment points and the fascicle angle and length , which can be estimated from the Hough transform.

applies simple trigonometry to transform cartesian into polar coordinates.

applies simple trigonometry to transform polar into cartesian coordinates.

is the gain vector. Note that its size is 1x4, but it only includes 3 unique values. This is because the vertical position correction and length correction use the same type of measurement and can thus share the same gain .

## Measurements

TimTrack detects the fascicle angle and the vertical location of the superficial and deep aponeurosis and . There are several steps involved to calculate the measurements. First, the fascicle position is determined given the aponeurosis attachment points in . Next, the measured fascicle attachment points follow from and . These are then used to estimate the vertical location of the superficial aponeurosis attachment point , and the fascicle length . The only remaining measurement is the horizontal attachment point , which cannot be correct with TimTrack. Instead, we correct it with a constant, set to the initial value.