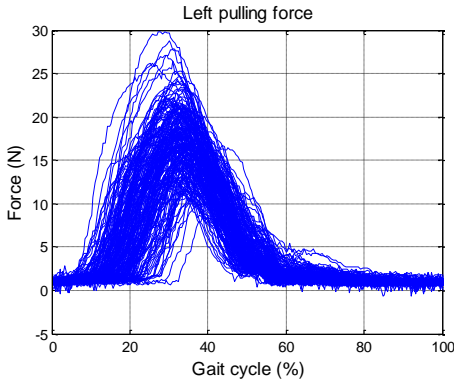


Appendix B. The intervention method to improve longitudinal symmetry

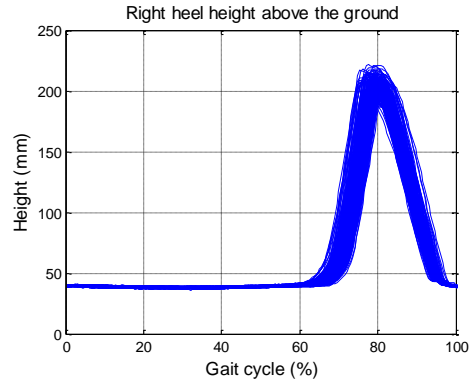
We invited therapists to conduct clinical NDT training and observed their actions on the test subjects. The therapists guided the subject's movements using the ropes attached to the subject's ASIS. We analyzed the therapists' applied forces and the subject's motions, as shown in Figure 1. We concluded that: (1) the therapist tended to apply cuing forces on the subject's ASIS approximately when observing the subject's heel strike on the opposite side; (2) the intervention force patterns were approximated as sinusoidal waves, as illustrated in Figure 1(a). Therefore, we control the motor system to track the following force command when detecting the HS on the opposite side.

$$F(t) = \frac{(\bar{F}_{\max} - \bar{F}_{\min})}{2} \times \sin(2\pi ft) + \frac{(\bar{F}_{\max} + \bar{F}_{\min})}{2}$$

where \bar{F}_{\max} and \bar{F}_{\min} represent the maximum and minimum forces, respectively, while f is the frequency. Furthermore, we set $\bar{F}_{\max} = 6$ lb, $\bar{F}_{\min} = 1$ lb, and $f = 1$ Hz to simplify the experiments.



(a) Applied force on the right ASIS



(b) Heights of the left heel

Figure 1. Analyses of the intervention patterns.