

Online Resource 3

Title: Phase indicator of the gait cycle.

Description: The dynamic models are switched to generate a single output signal for a joint. Thus, a model switch indicator is built to show the current phase of the gait cycle; physically, this indicator is implemented in the exoskeleton with pressure sensors located at the ends of each foot.

Article: Dynamic modeling of human–exoskeleton interaction: A simulation framework for gait rehabilitation.

Journal: Multibody System Dynamics

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Left leg		Right leg		Phase of gait cycle
Heel	Toe	Heel	Toe	
1	1			Model No. 1: double support with initial right-leg support Note: If (right toe(x) > left toe(x))
1	0	1	1	
0	1			
1	1			Model No. 1: double support with initial right-leg support Note: If (right toe(x) > left toe(x))
1	0	1	0	
0	1			
1	1			Model No. 1: double support with initial right-leg support Note: If (right toe(x) > left toe(x))
1	0	0	1	
0	1			
0	0	1	1	Model No. 2: right support with left swing Note: Right foot fully supported on the ground
0	0	1	0	Model No. 2: right support with left swing
0	0	0	1	Model No. 2: right support with left swing
1	1			Model No. 3: double support with initial left-leg support Note: If (left toe(x) > right toe(x)) or (left toe(x) == right toe(x)) Initial position: standing state
1	0	1	1	
0	1			
1	1			Model No. 3: double support with initial left-leg support Note: If (left toe(x) > right toe(x))
1	0	1	0	
0	1			
1	1			Model No. 3: double support with initial left-leg support Note: If (left toe(x) > right toe(x))
1	0	0	1	
0	1			
1	1	0	0	Model No. 4: left support with right swing Note: Left foot fully supported on the ground
1	0	0	0	Model No. 4: left support with right swing
0	1	0	0	Model No. 4: left support with right swing