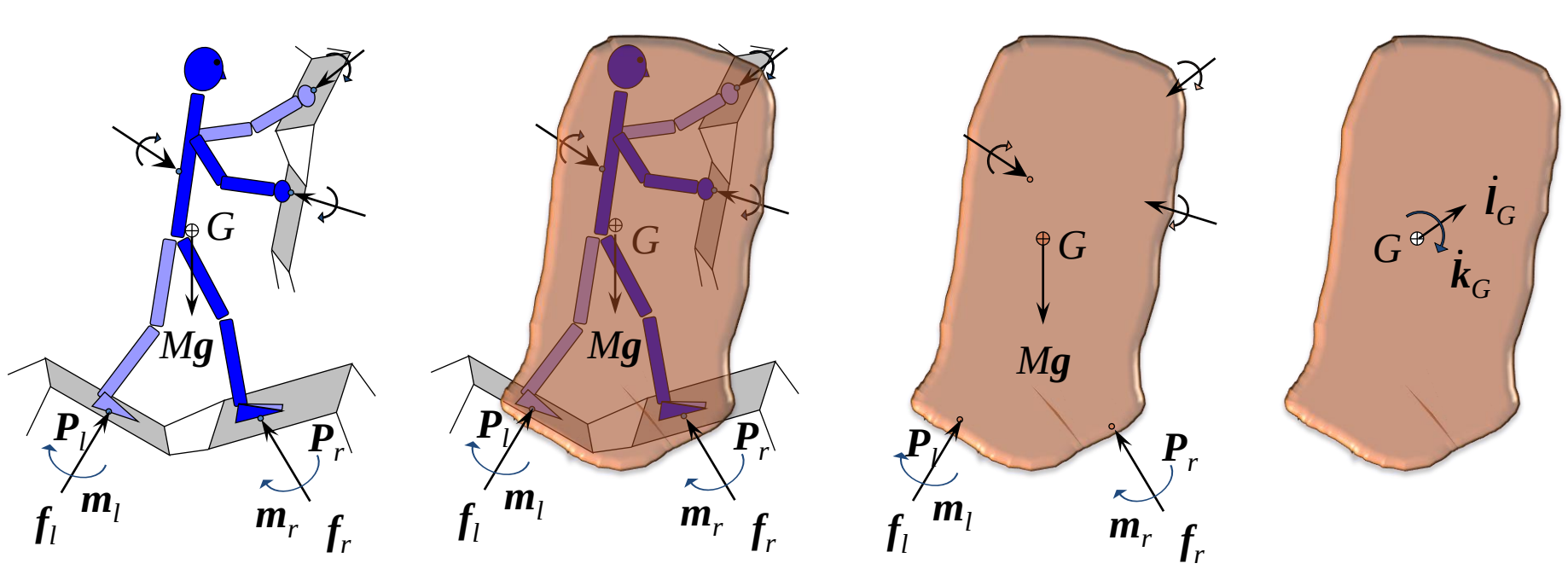
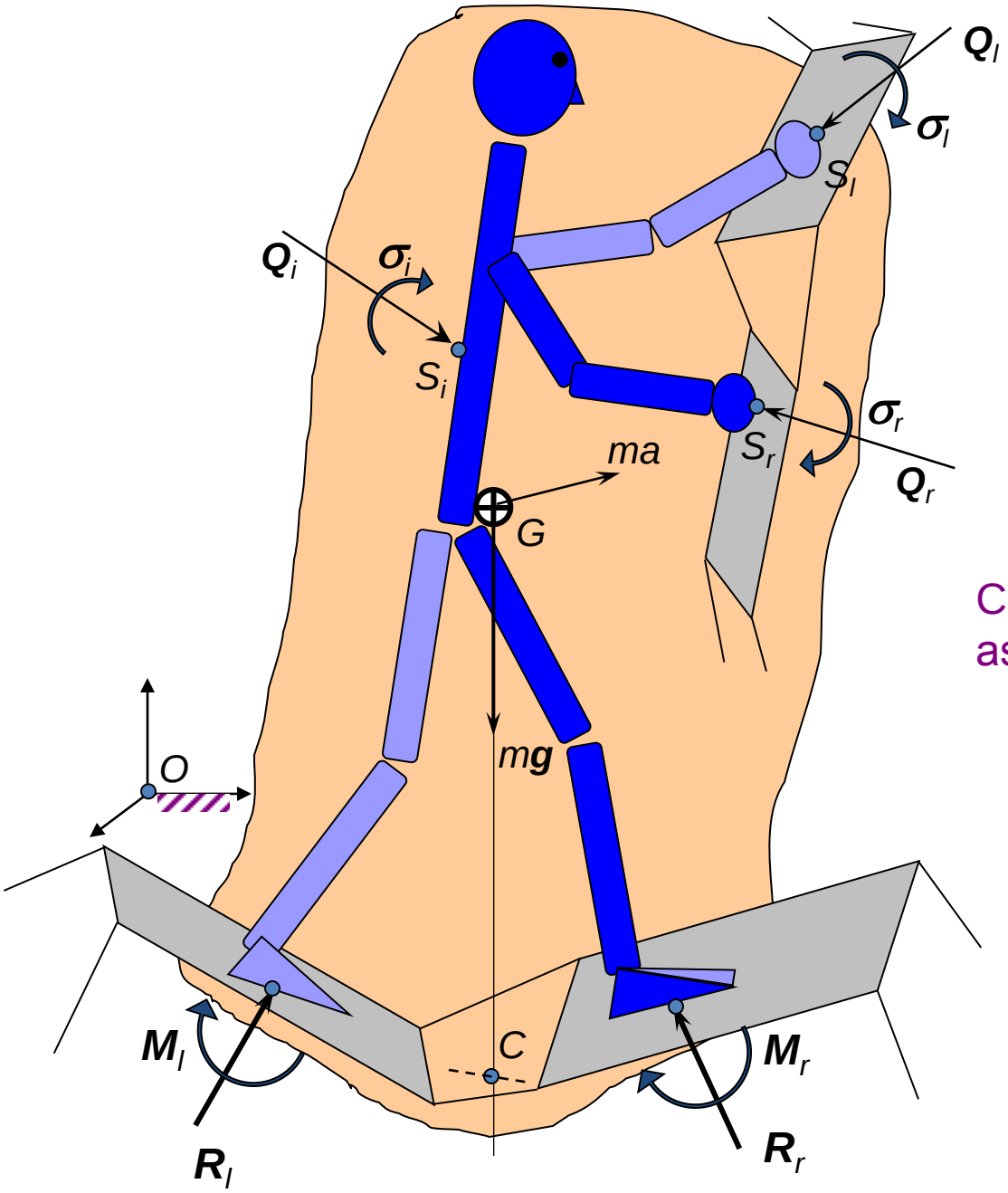
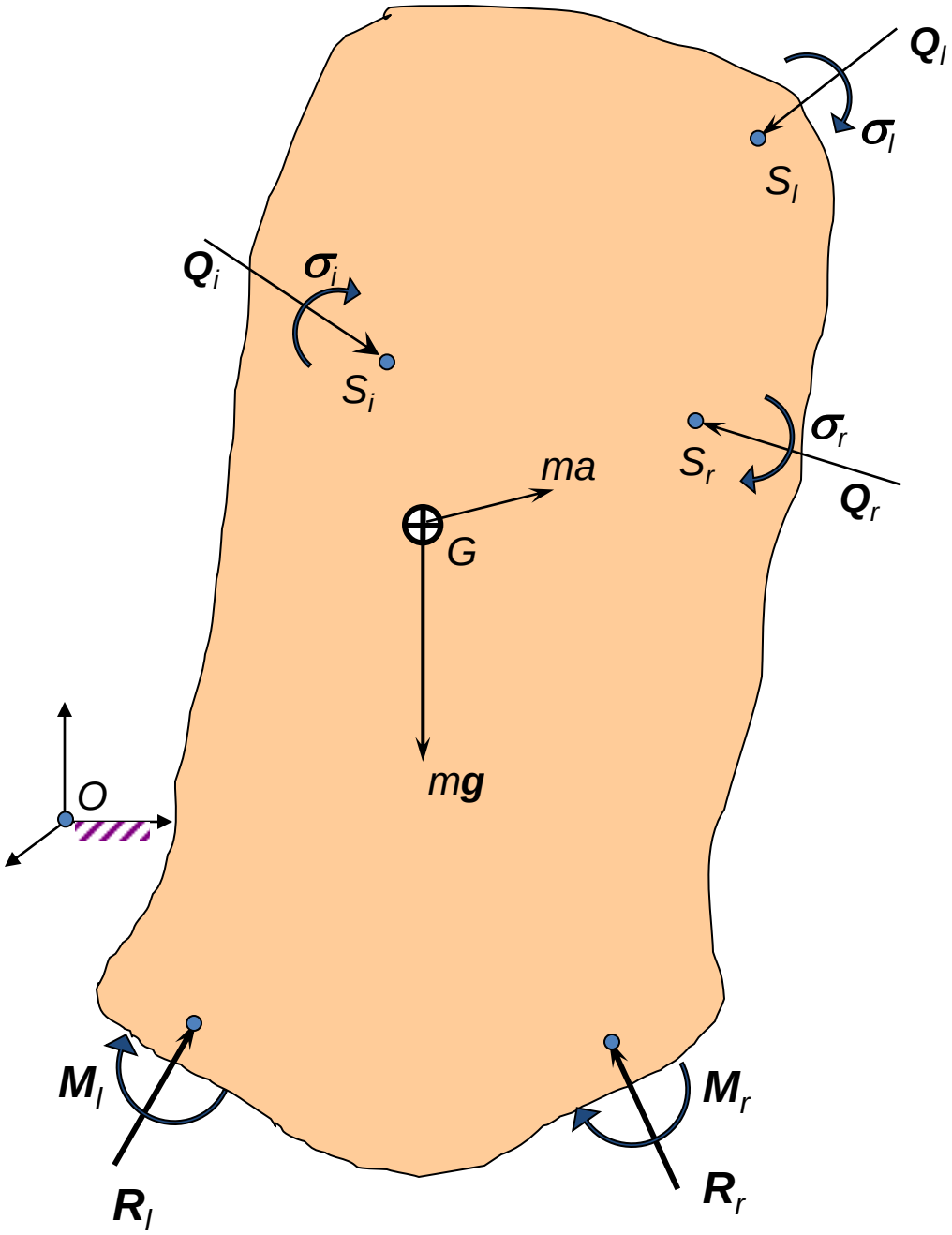

G
Mg
P_l
P_r
f_l
m_l
m_r
f_r
(a)
(b)
(c)
(d)
i_G
k_G

General interaction scenario between robot and environment



Consider the entire system as a whole, and …


Q_l
σ_l
S_l
Q_i
σ_i
S_i
σ_r
S_r
Q_r
ma
G
mg
O
M_l
R_l
M_r
R_r