



Vorlesung **Biorobotik**

Unitnummer 473001

Modul 47300 **Biorobotik**

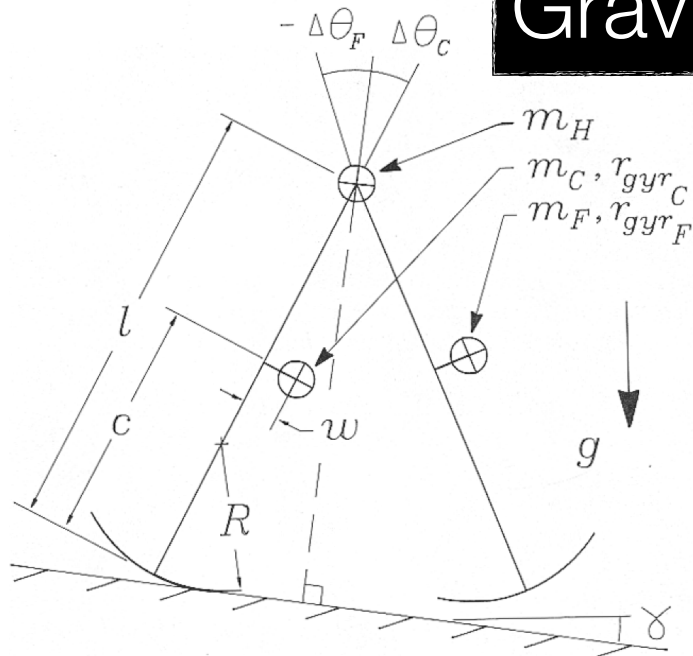
Prüfungsnummer 47301

Prinzipien der biologischen Bewegung II

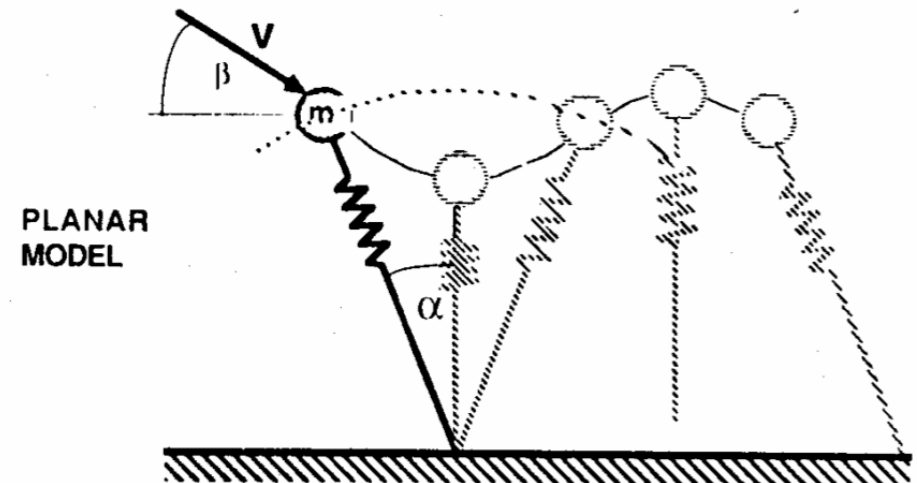


Konzepte der biologischen Fortbewegung

Gravity walker



Feder-Masse-Modell



Konzepte: Gravity walker



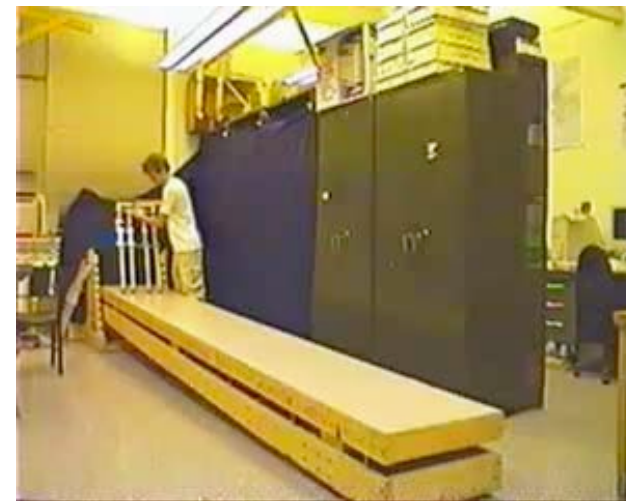
McGeer, 1990



Ikemata et al., 2005

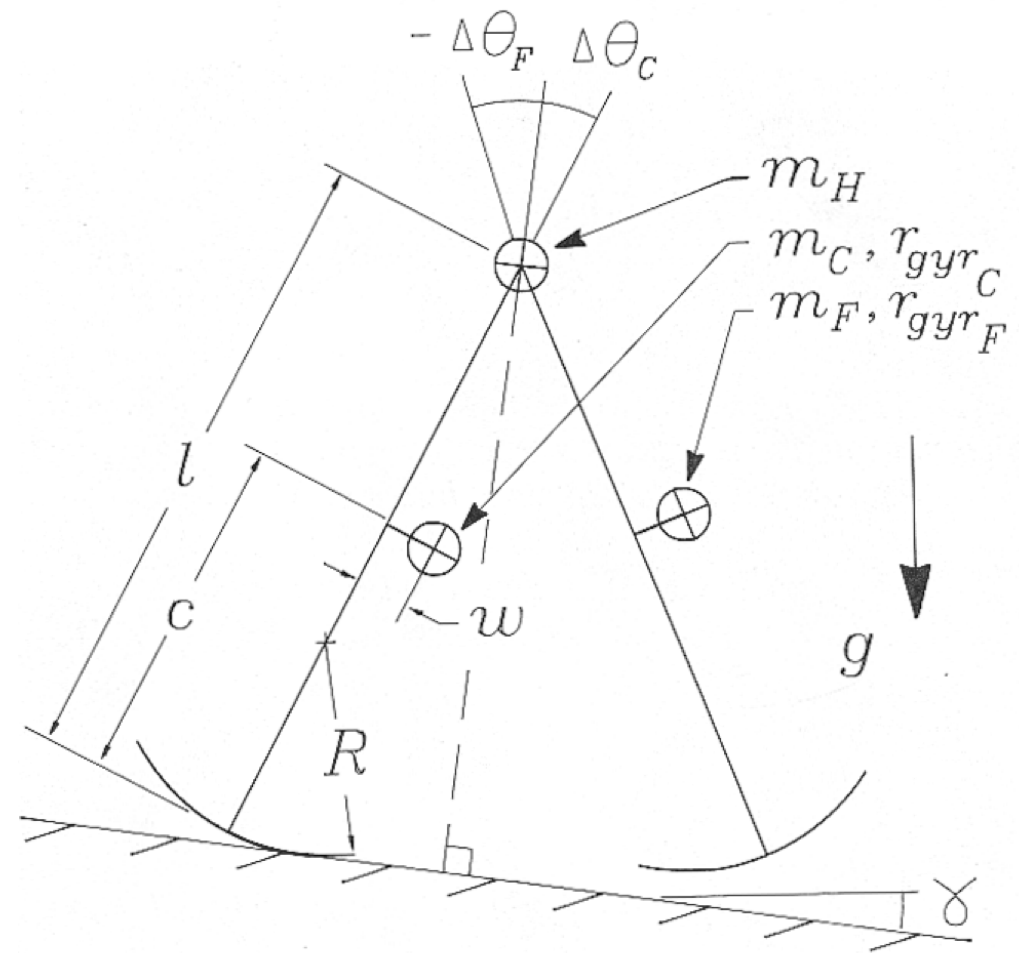
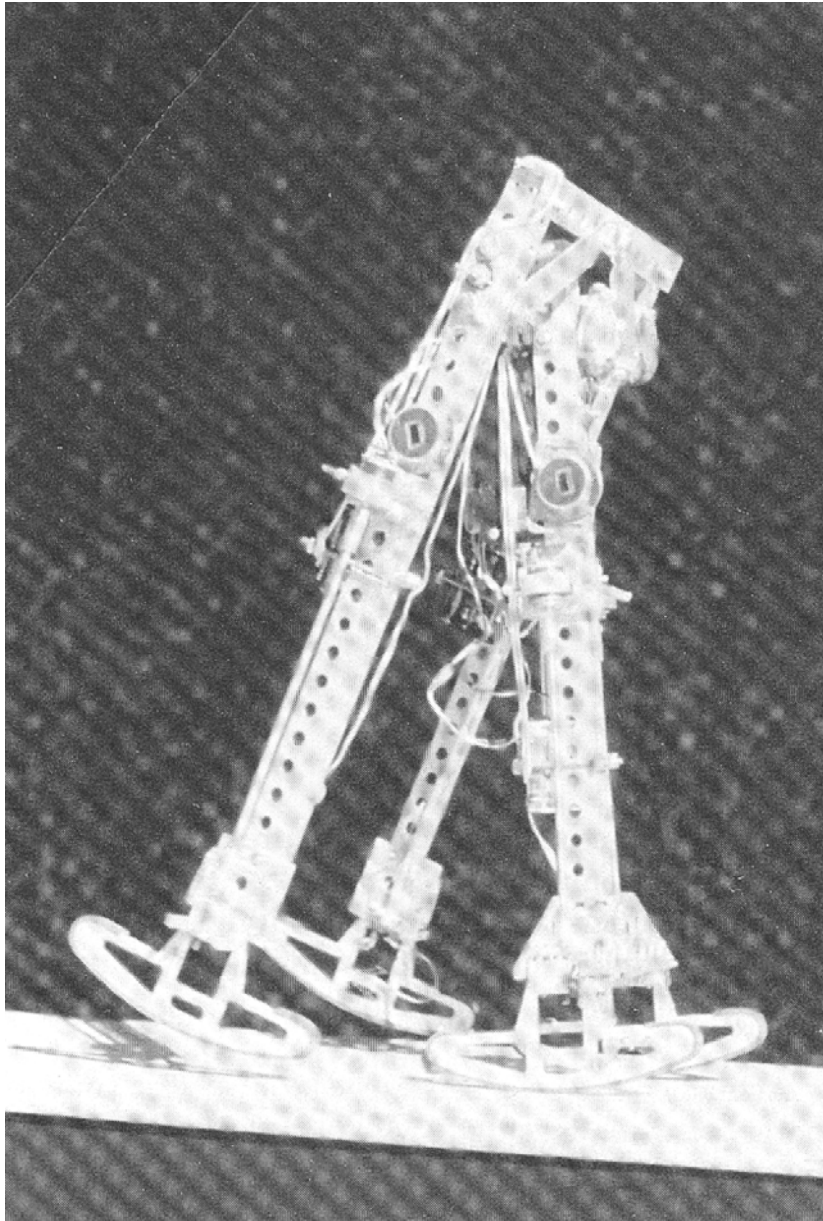


Collins, 2001



Civay et al., 2001

Konzepte: Gravity walker



Konzepte: Gravity walker

Measure of efficiency of transport mode:
specific resistance = γ , for a vehicle
powered by a descending slope

$$SR \equiv \frac{\text{resistive force}}{\text{weight}} = \frac{\text{mechanical work done}}{\text{weight} \times \text{distance travelled}}$$

C: contact, **F**: free

$\Delta\theta$: rotation from surface normal

leg length: **l**

gravitation: **g**

adjustable parameters:

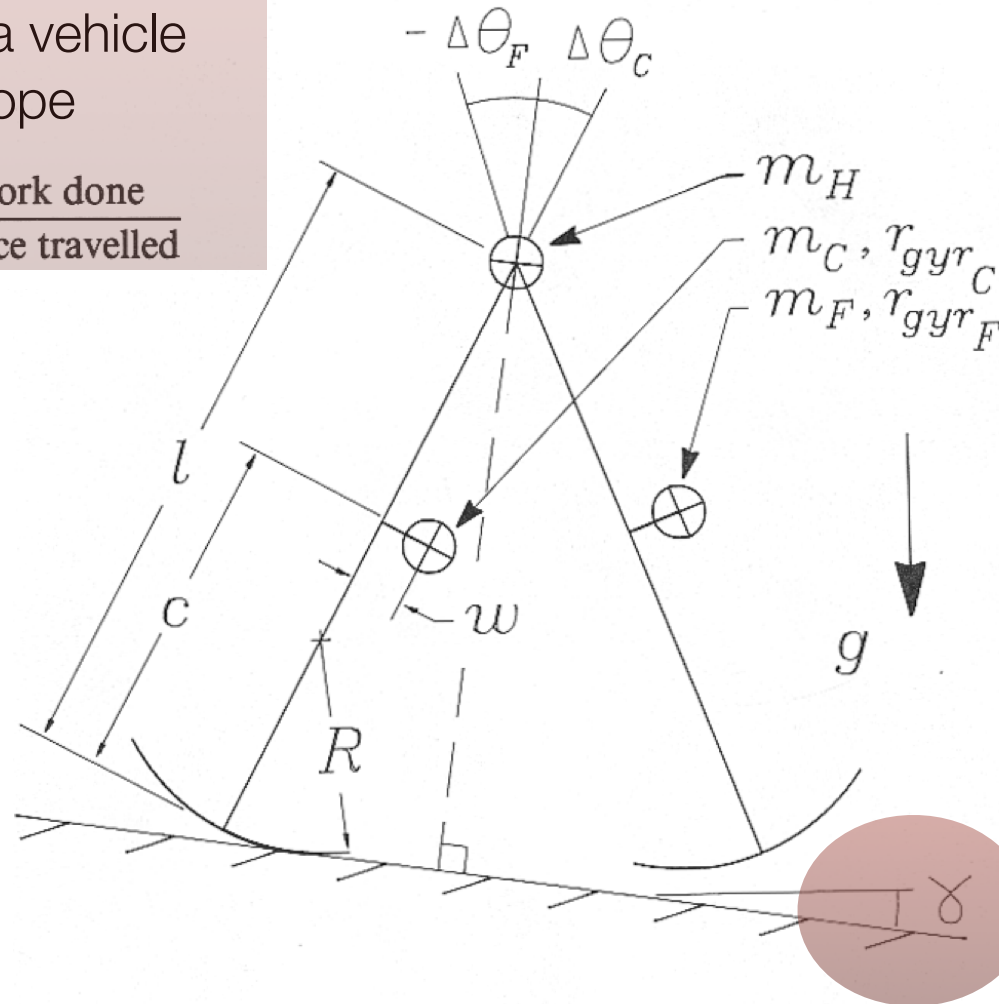
Foot radius: **R**

Hip mass fraction: **m_H**

Leg center of mass height: **c**

Fore/aft center of mass offset: **w**

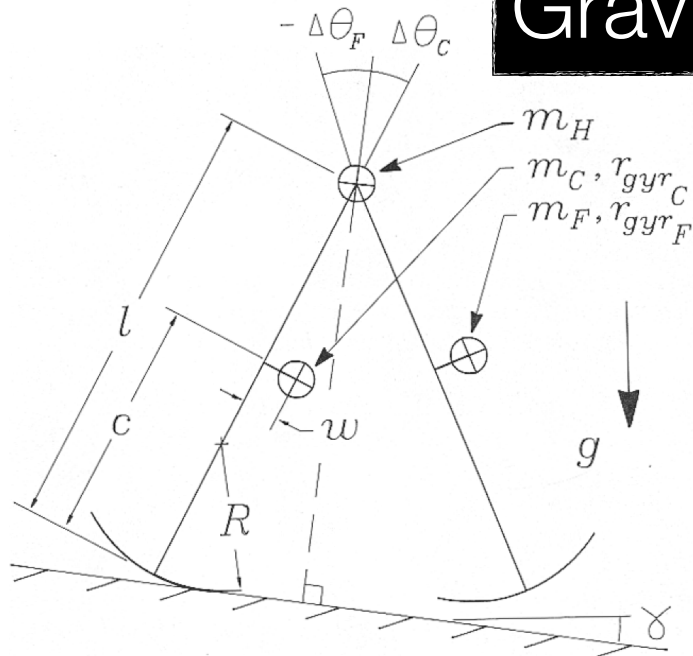
Leg radius of gyration: **r_{gyr}**



McGeer T. (1990). Passive dynamic walking. *The International Journal of Robotics Research* 9(2):62–82₅

Konzepte der biologischen Fortbewegung

Gravity walker



Feder-Masse-Modell

