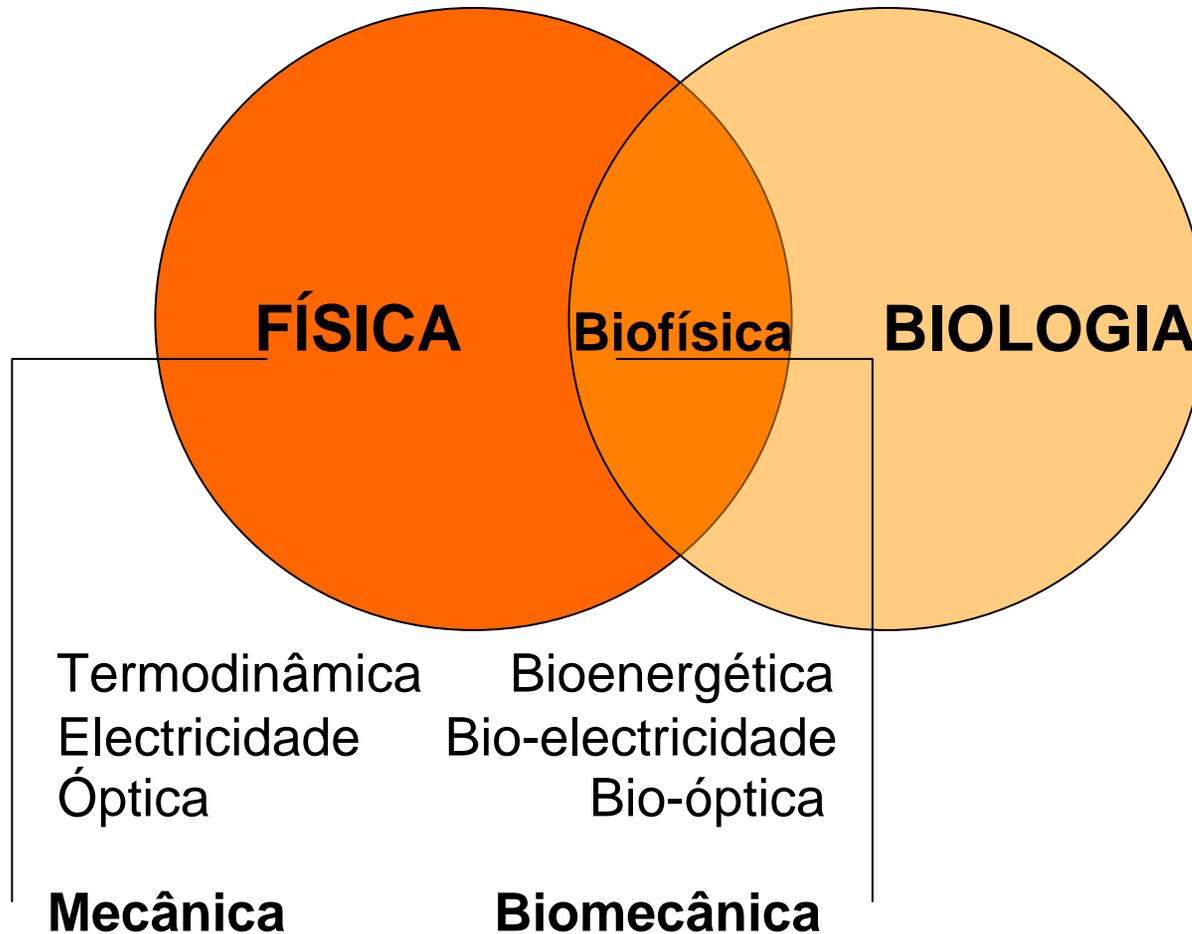




Definições e contextualização



A Biofísica





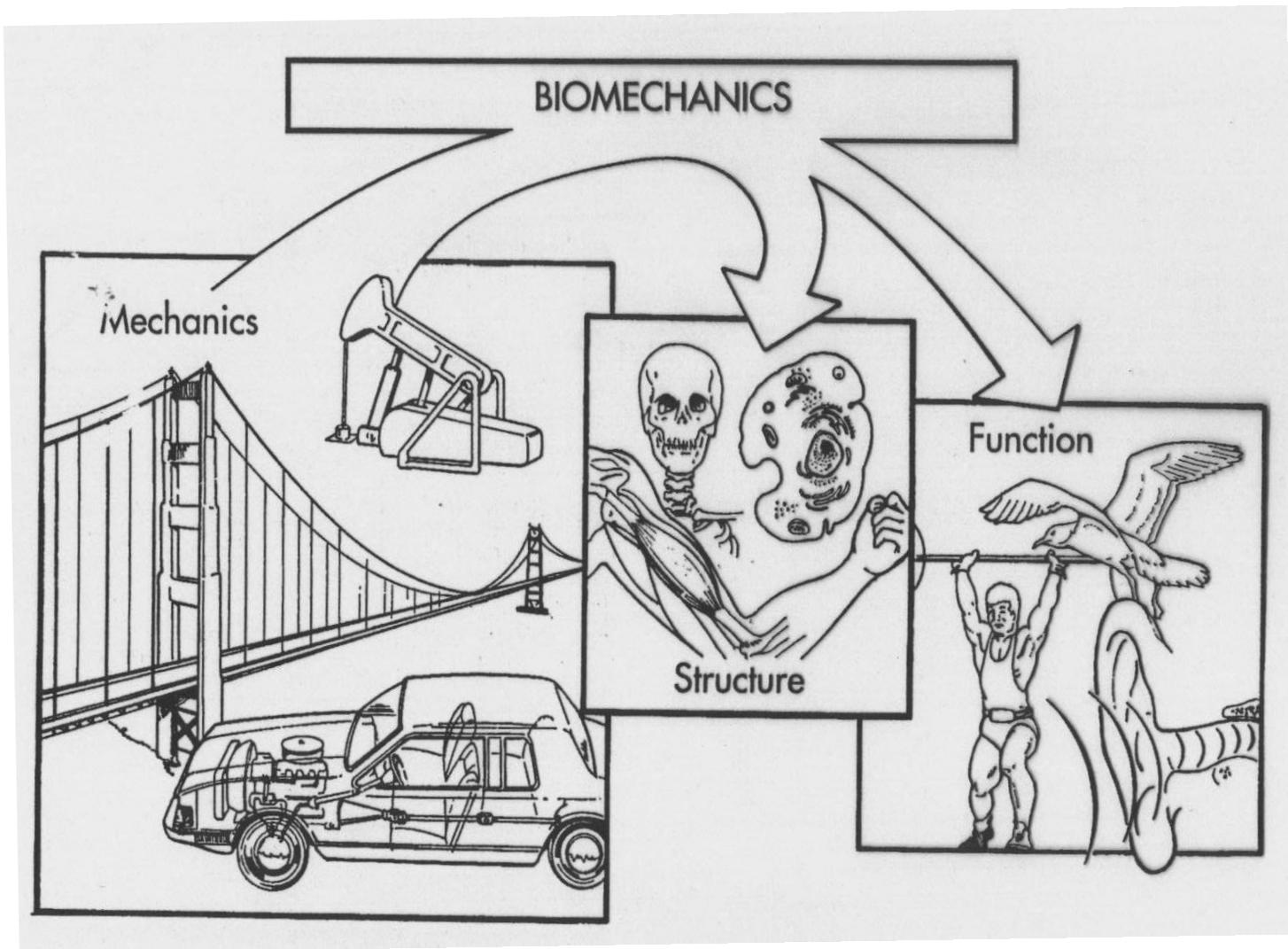
Definição de Biomecânica

Estudo da estrutura e da função dos sistemas biológicos, utilizando os métodos da mecânica.

**(Enoka, 1988; Hall, 1991;
Adrian e Cooper, 1995)**



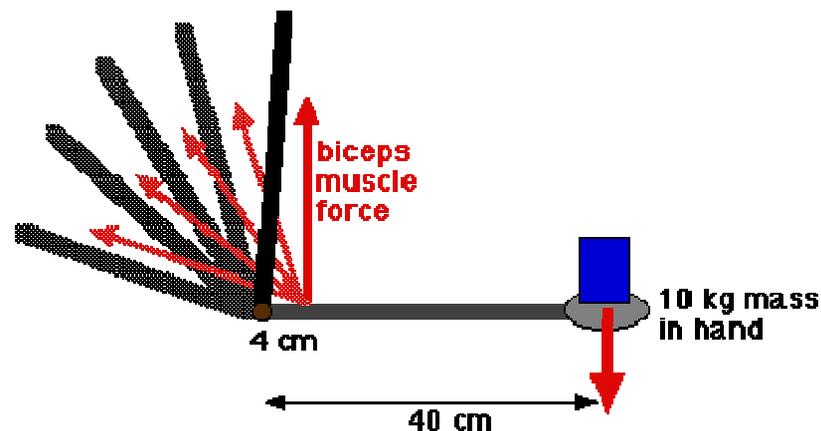
Contributos para a Biomecânica





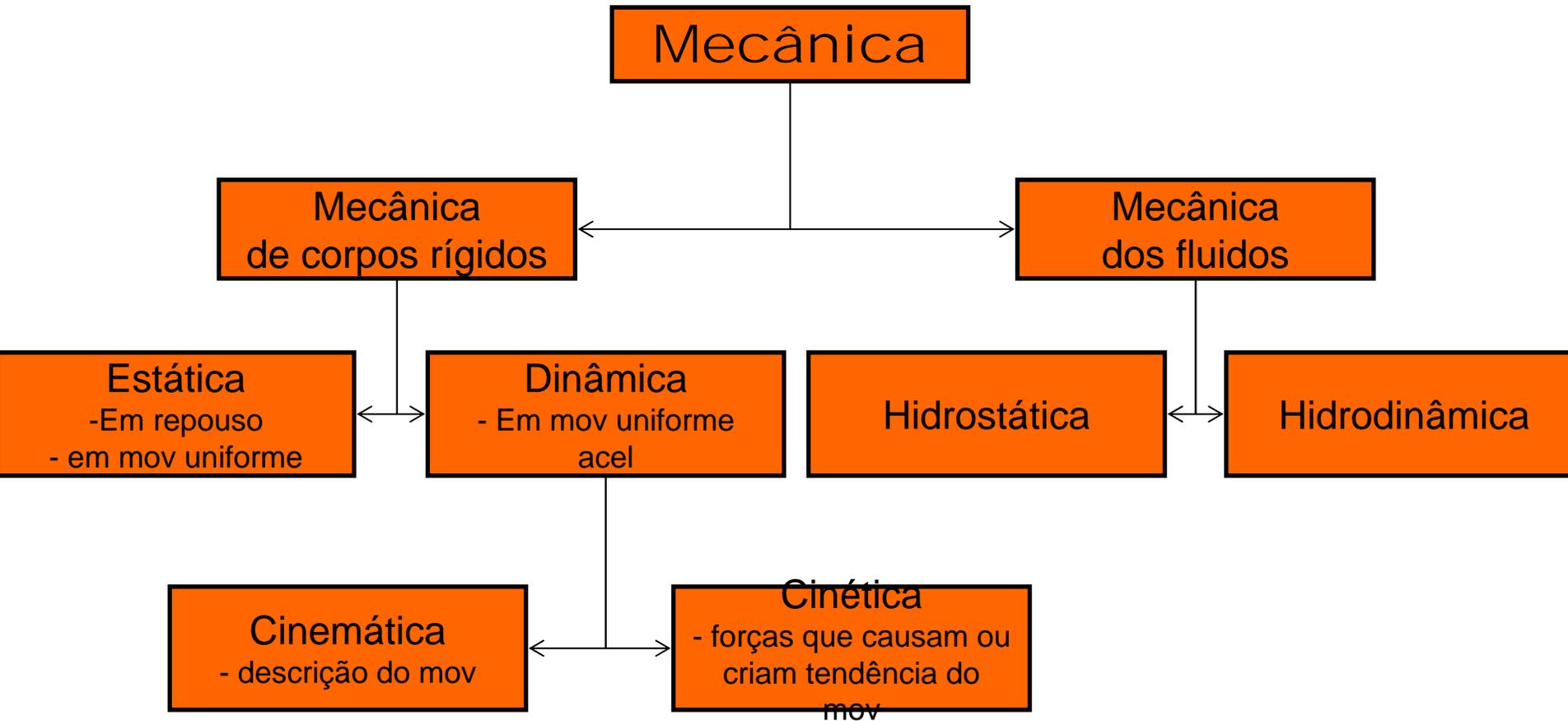
Definição de Mecânica

Ciência que descreve e prediz as condições de repouso ou de movimento de corpos sob acção de forças.





Ramos da Mecânica

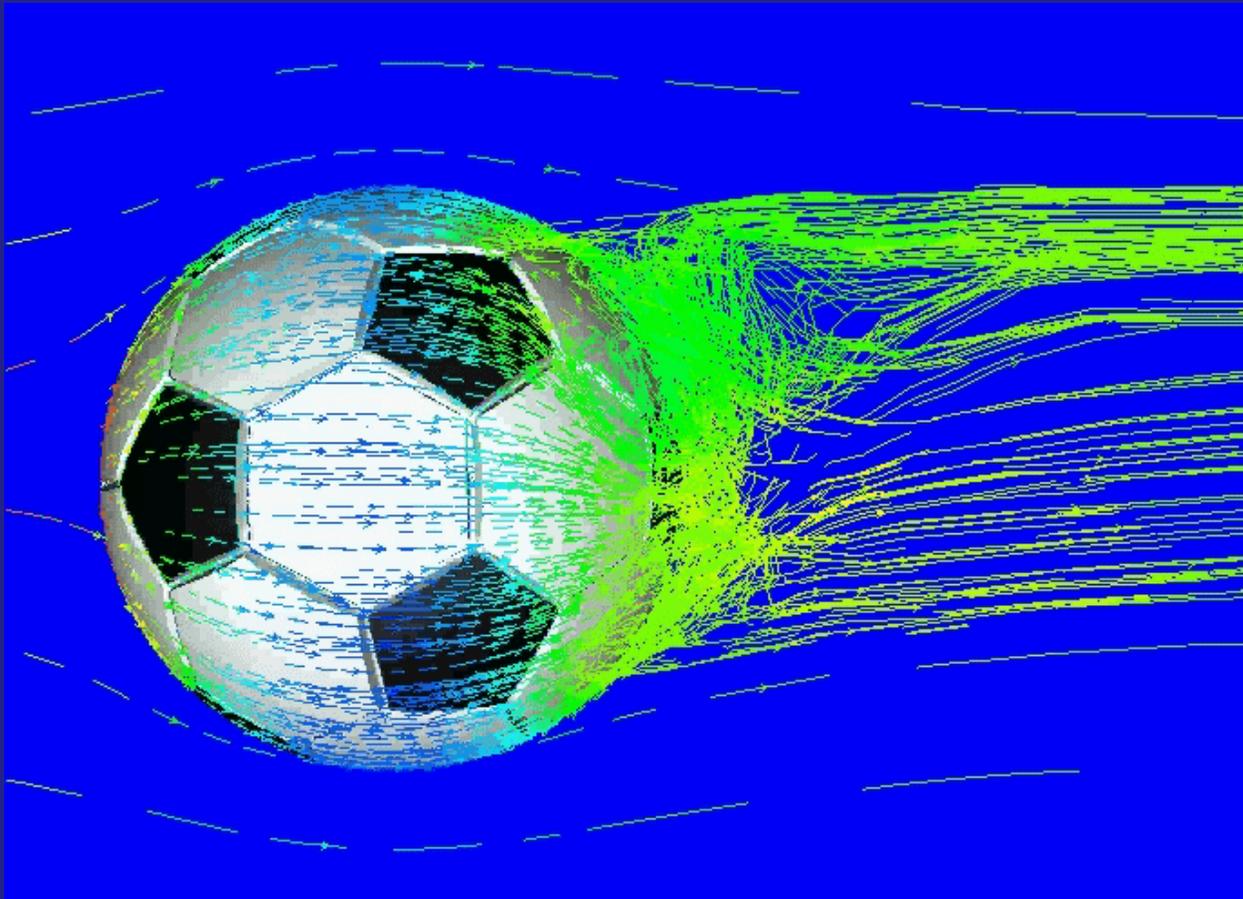




Mecânica dos fluidos



Fluidos e Teorema de Reynolds





Impulsão e GRF

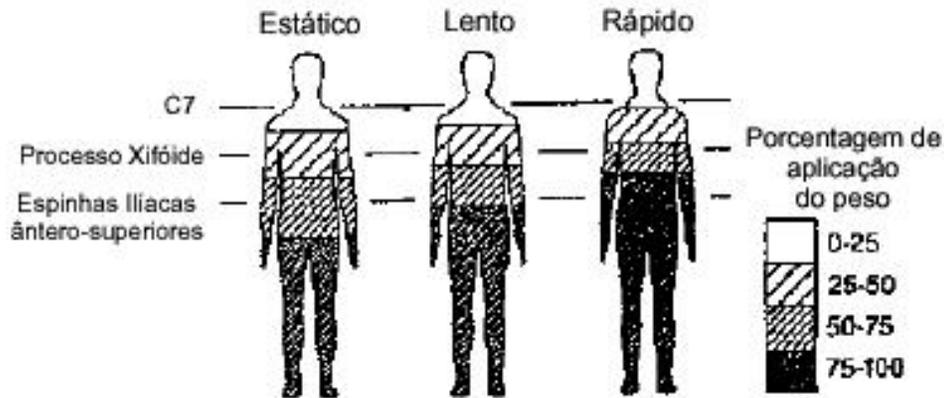
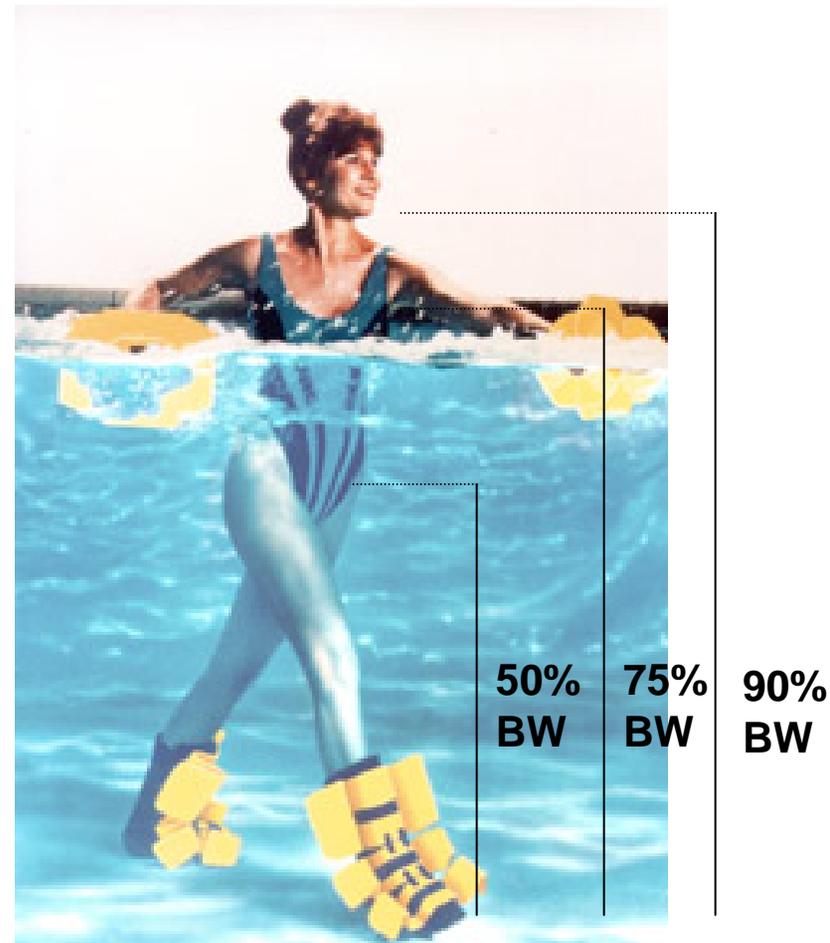


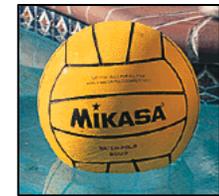
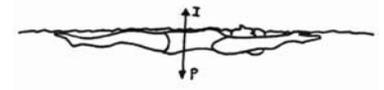
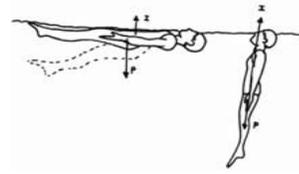
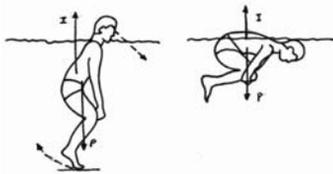
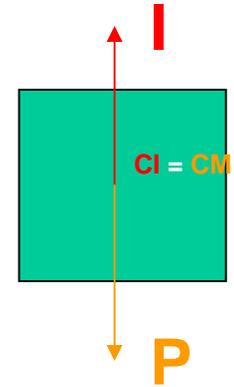
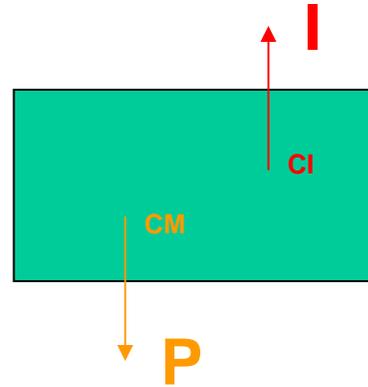
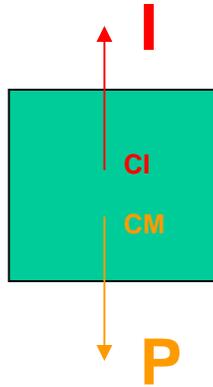
Figura 23. Força de reação do solo em situação estática e durante o andar em diferentes níveis de imersão (adaptado de HARRISON *et al.* 1992).



(Duarte, 2001)



Tipos de Equilíbrio



Estável

Instável

Indiferente



Flutuabilidade



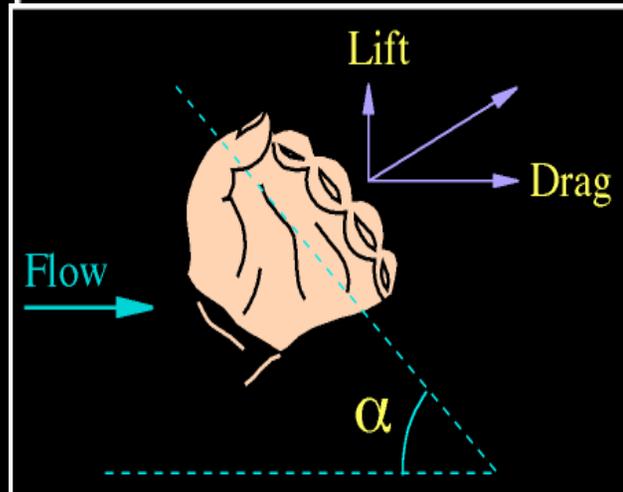
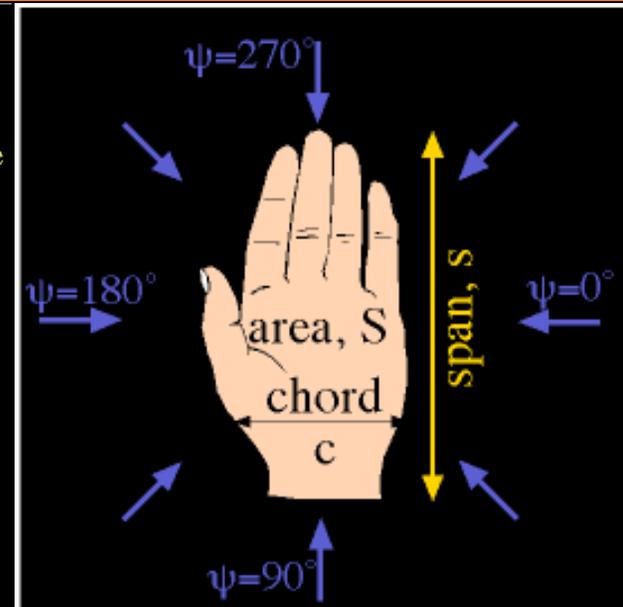
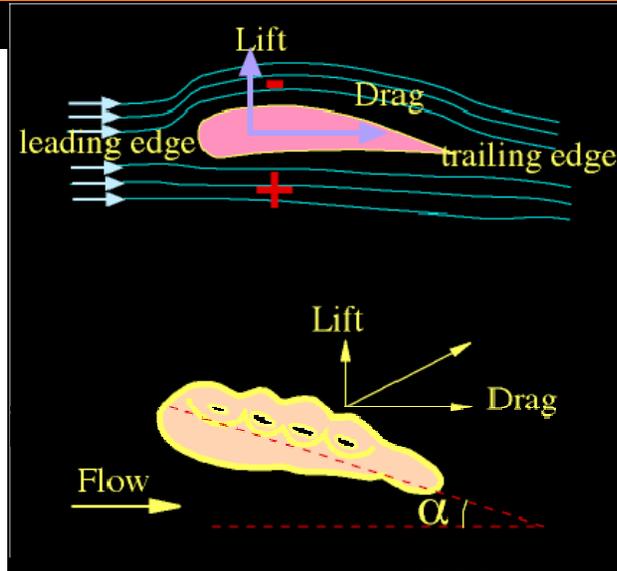
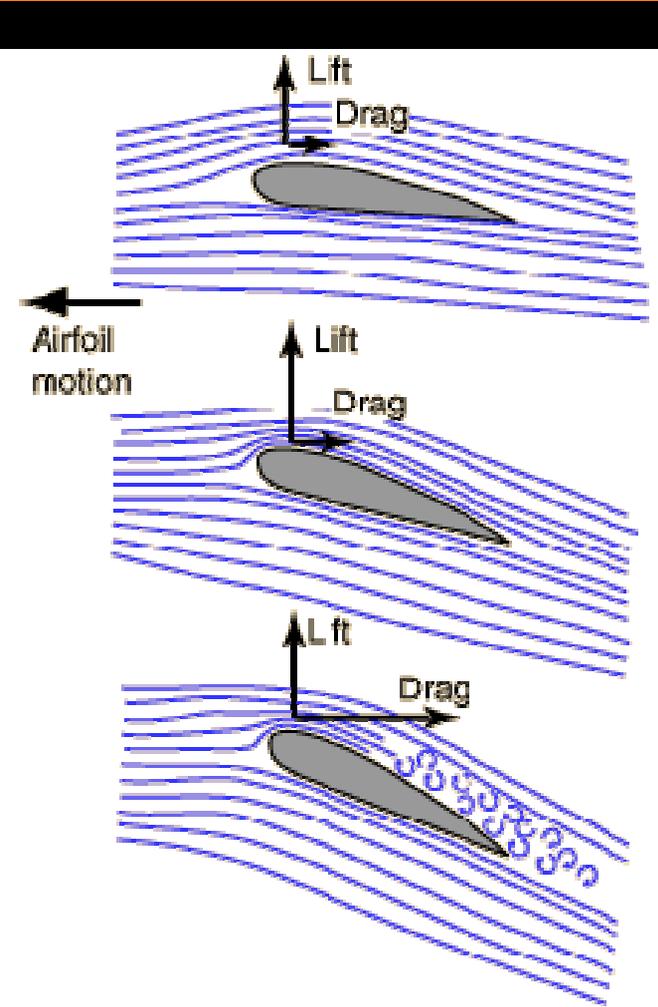


Flutuabilidade

- 1) Sexo**
- 2) Idade**
- 3) Raça**
- 4) Características físicas**
- 5) Composição corporal**



Forças Propulsivas





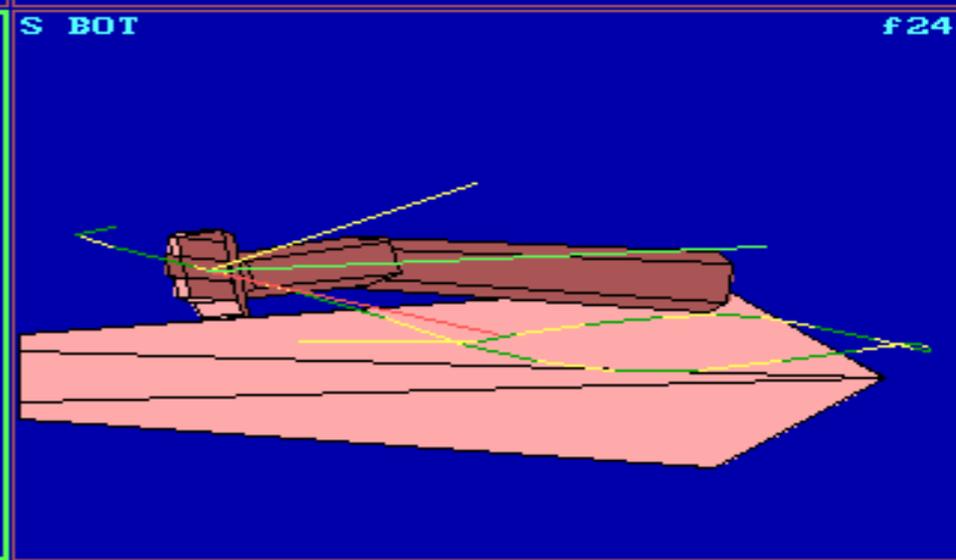
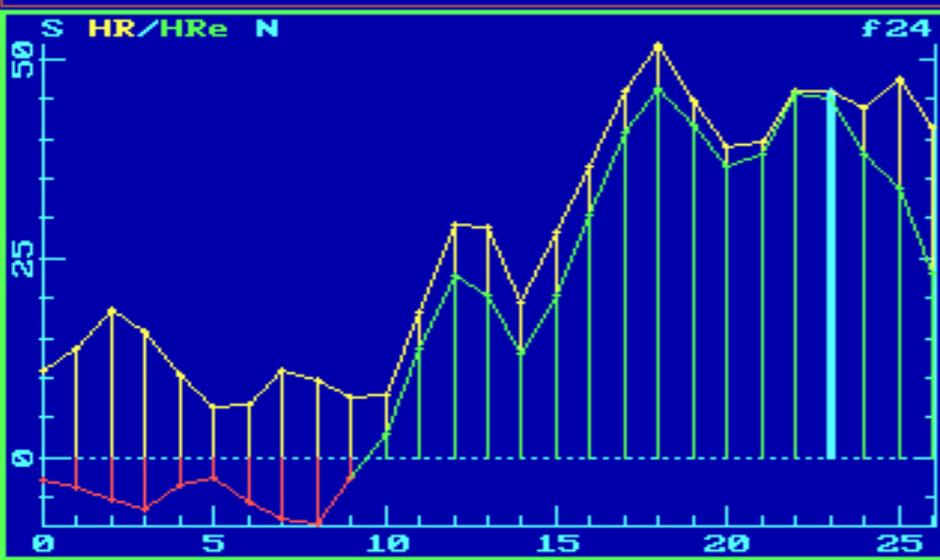
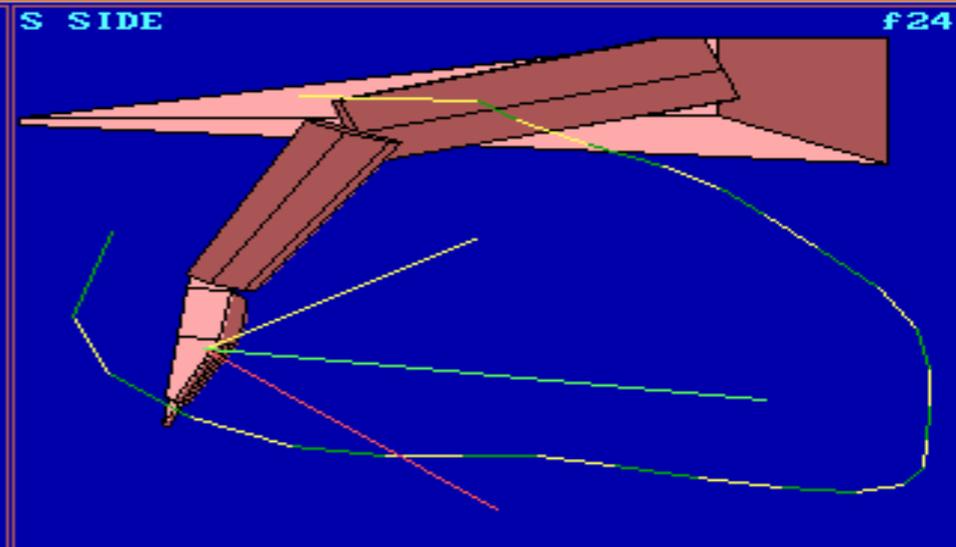
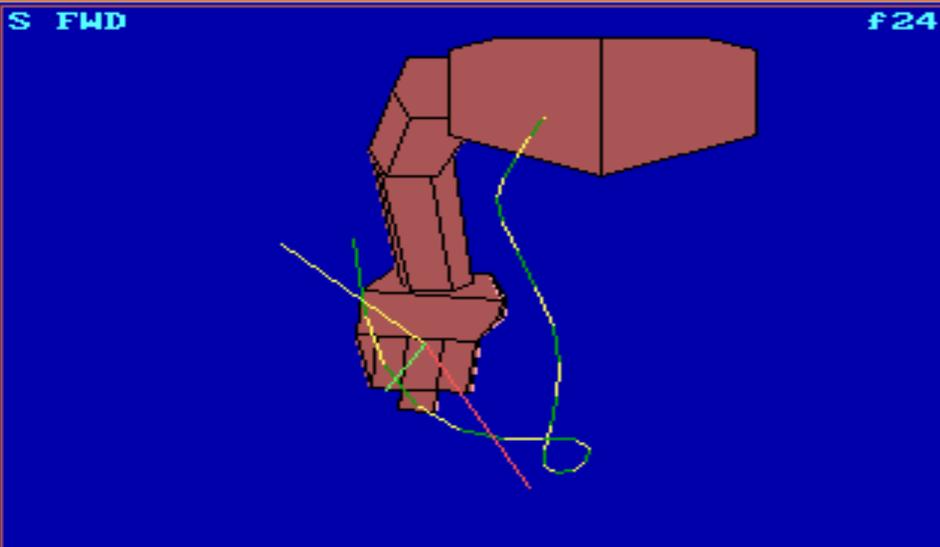
Efeito Magnus





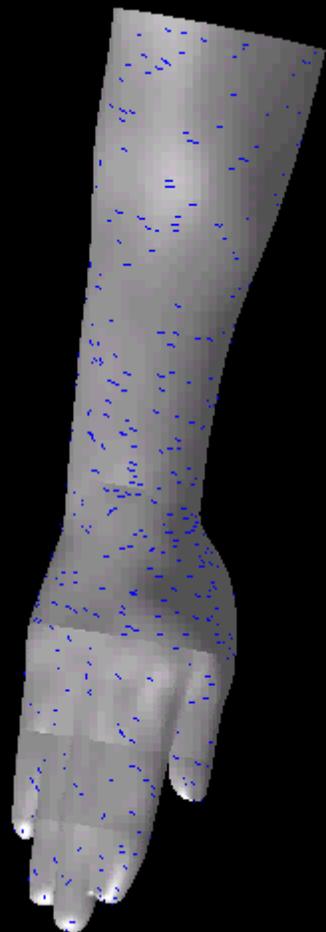


Forças Propulsivas



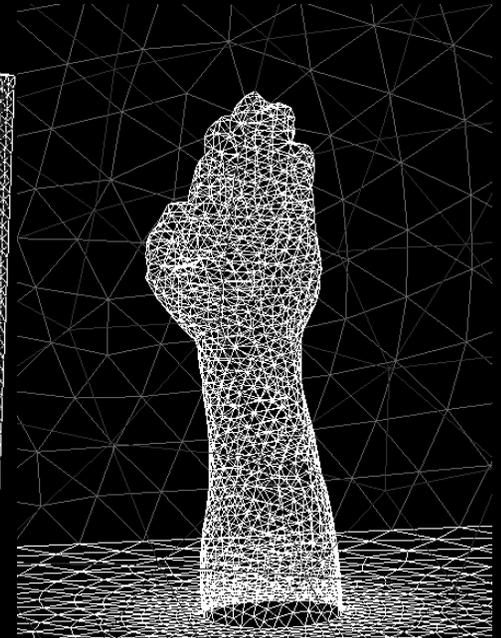
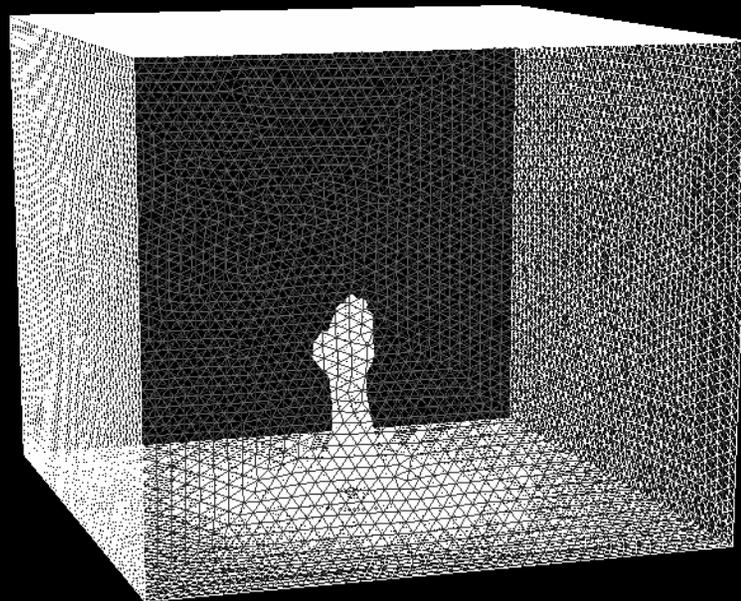


Forças Propulsivas





Forças Propulsivas



(Marinho et al., 2008)

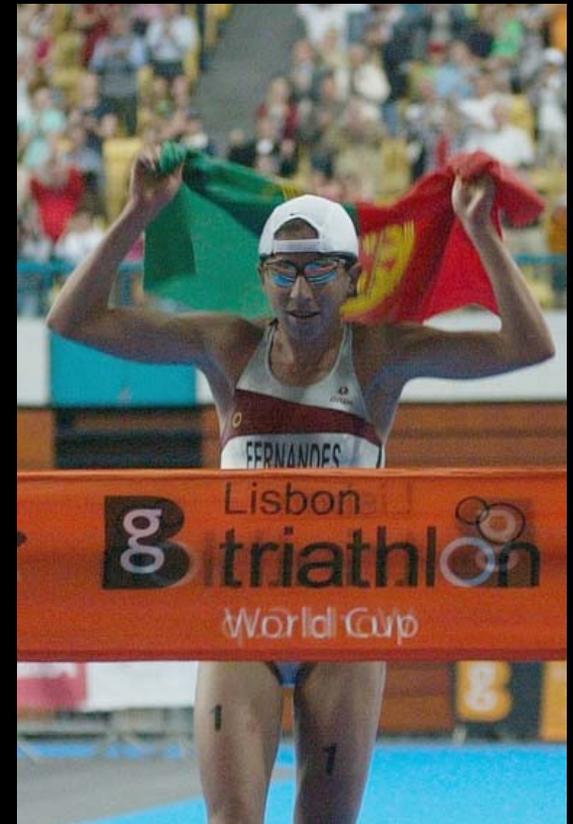


Drafting



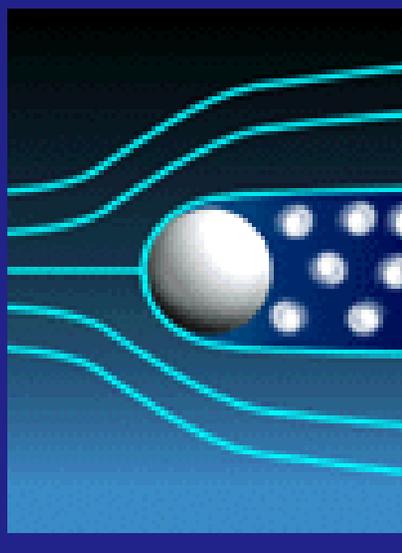
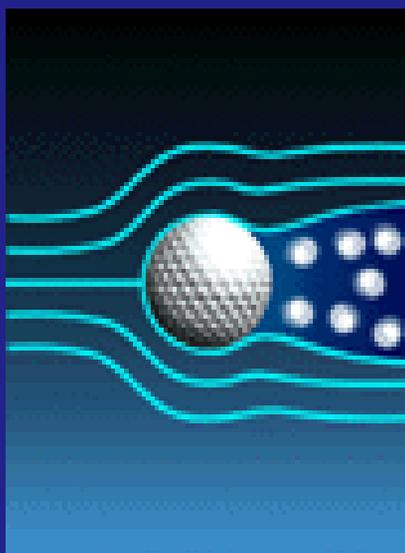
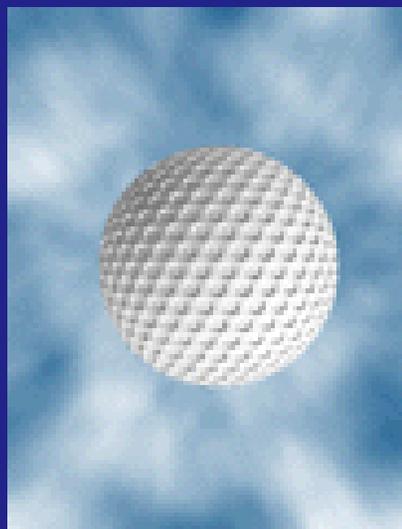


Drafting



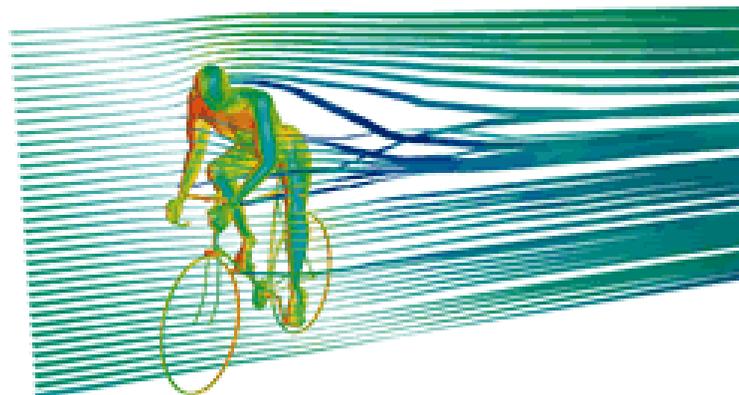
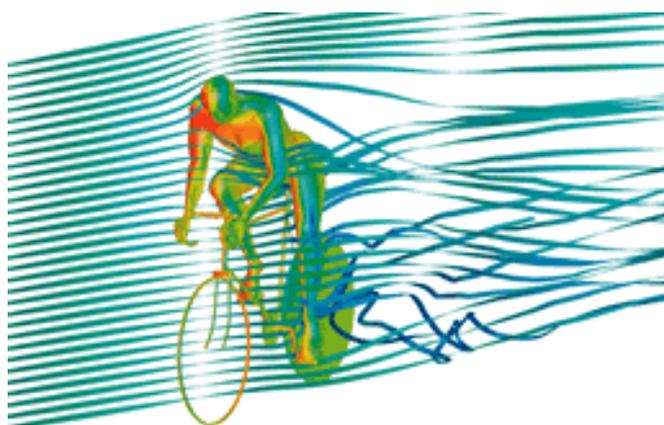
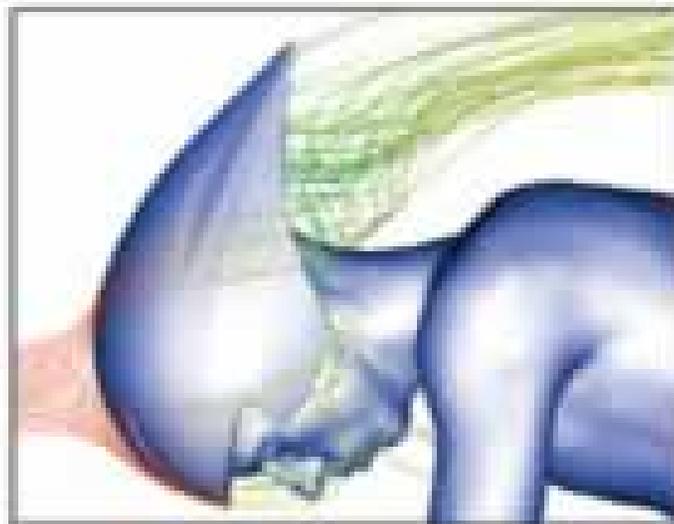
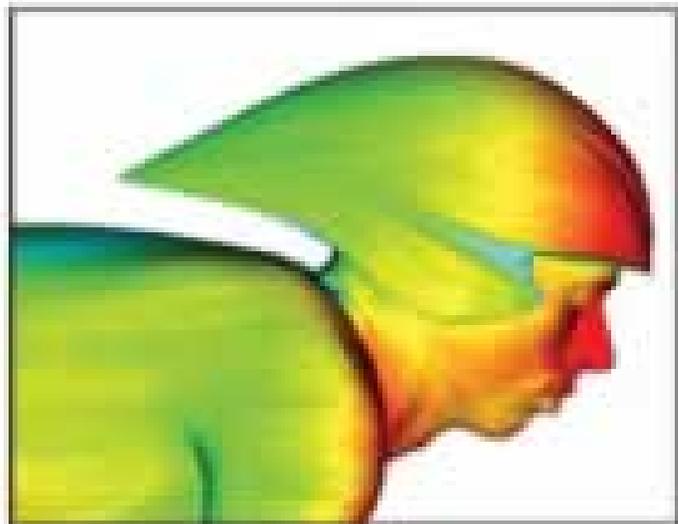


Arrasto



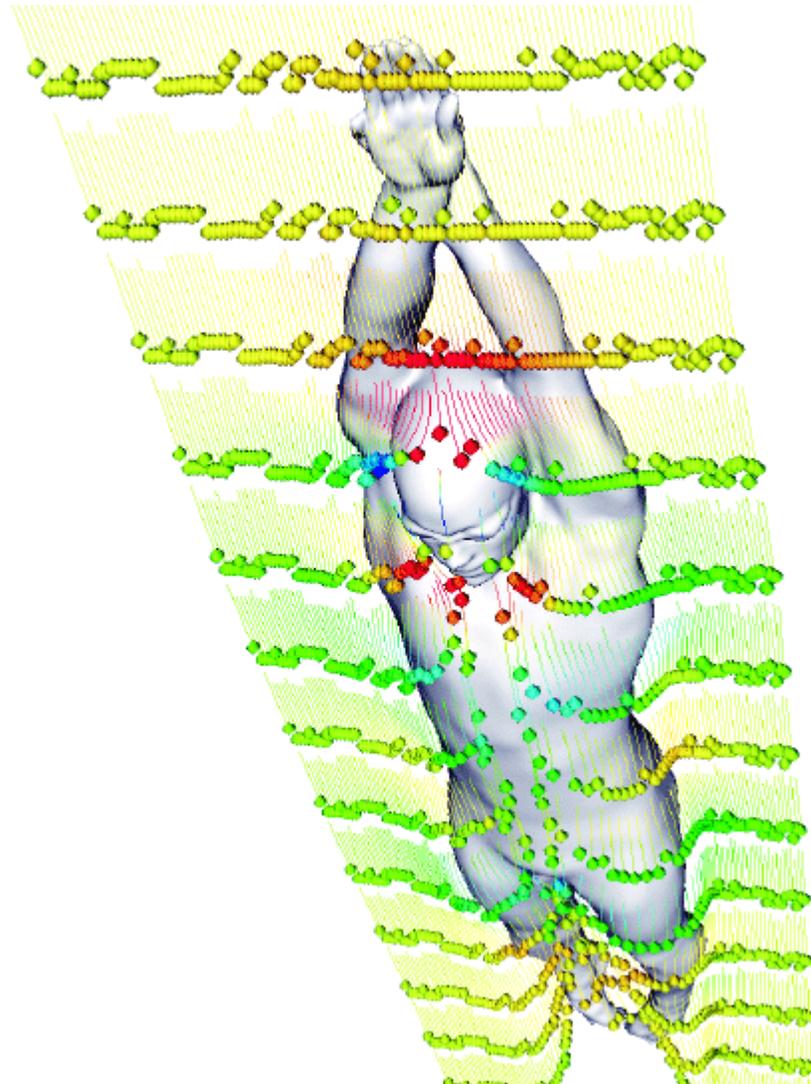
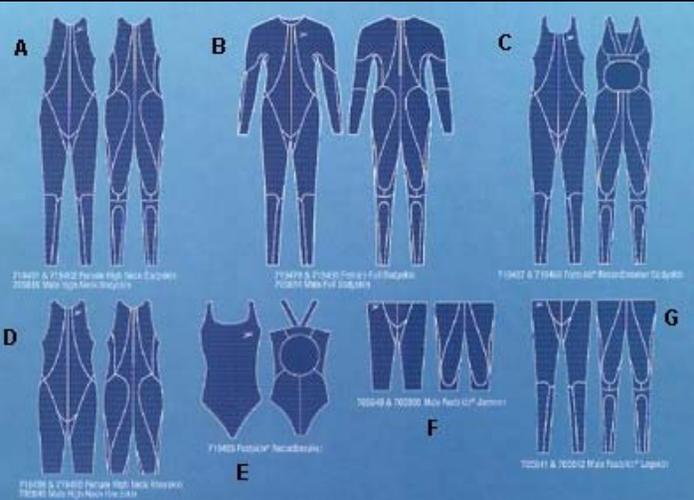
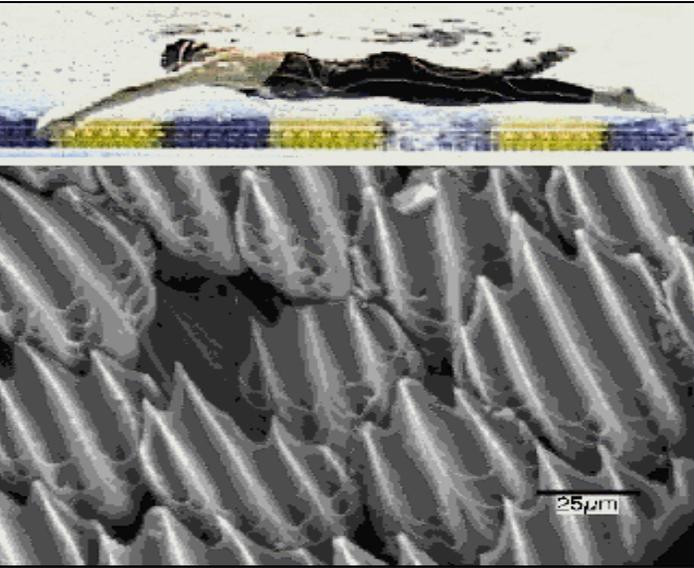


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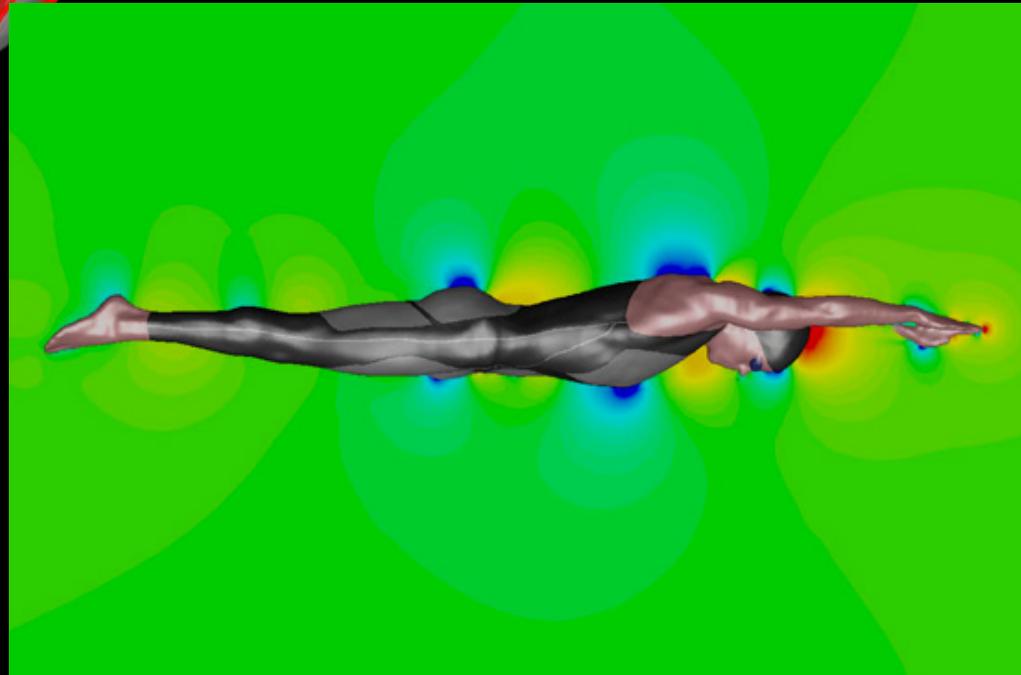
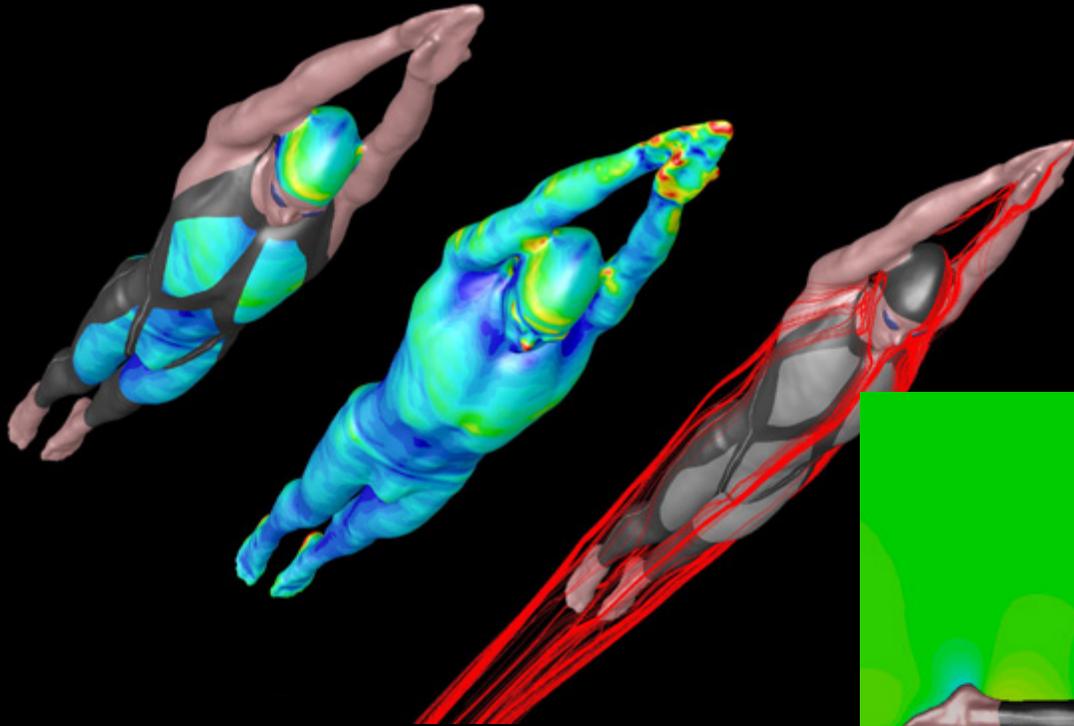


Arrasto



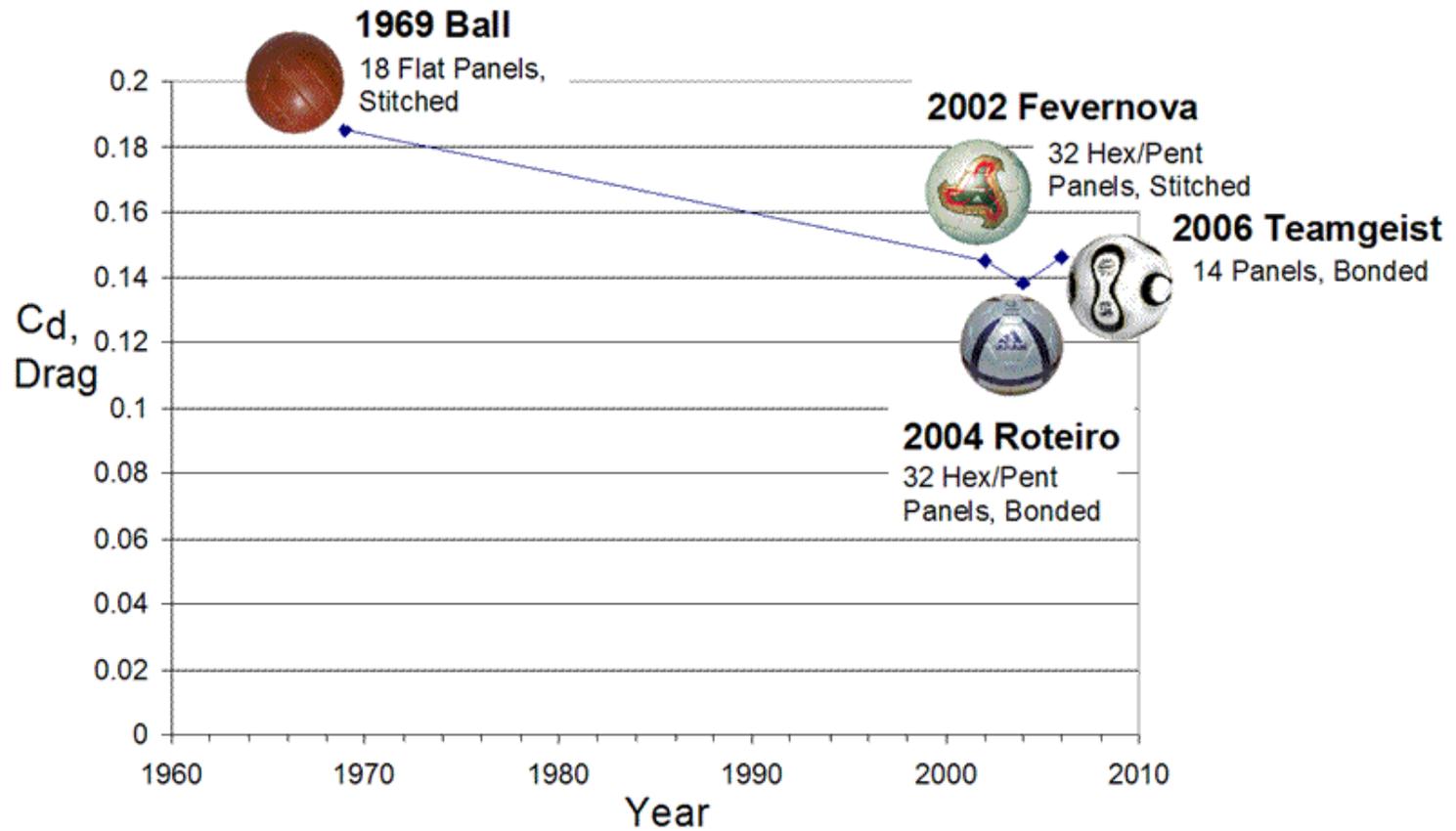


Arrasto





Arrasto





Estática

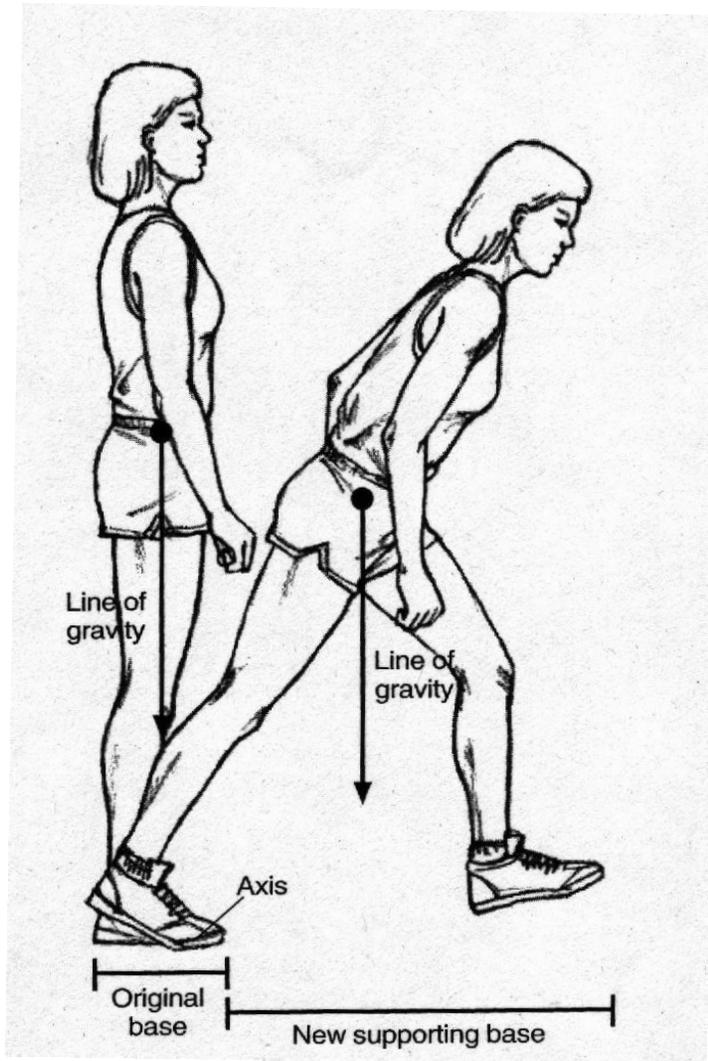


Centro de massa



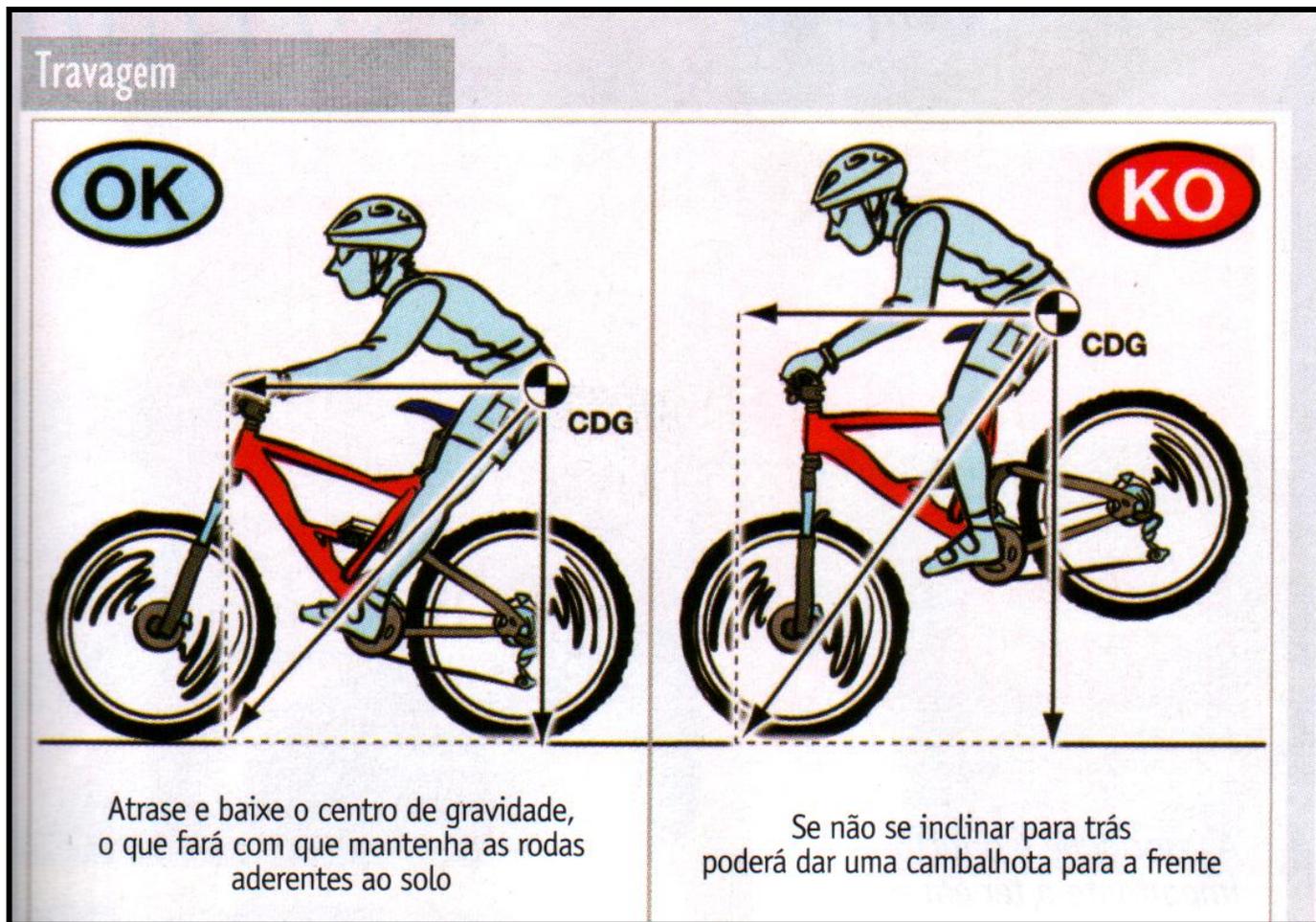


Equilíbrio e estabilidade





Equilíbrio e estabilidade





Equilíbrio e estabilidade

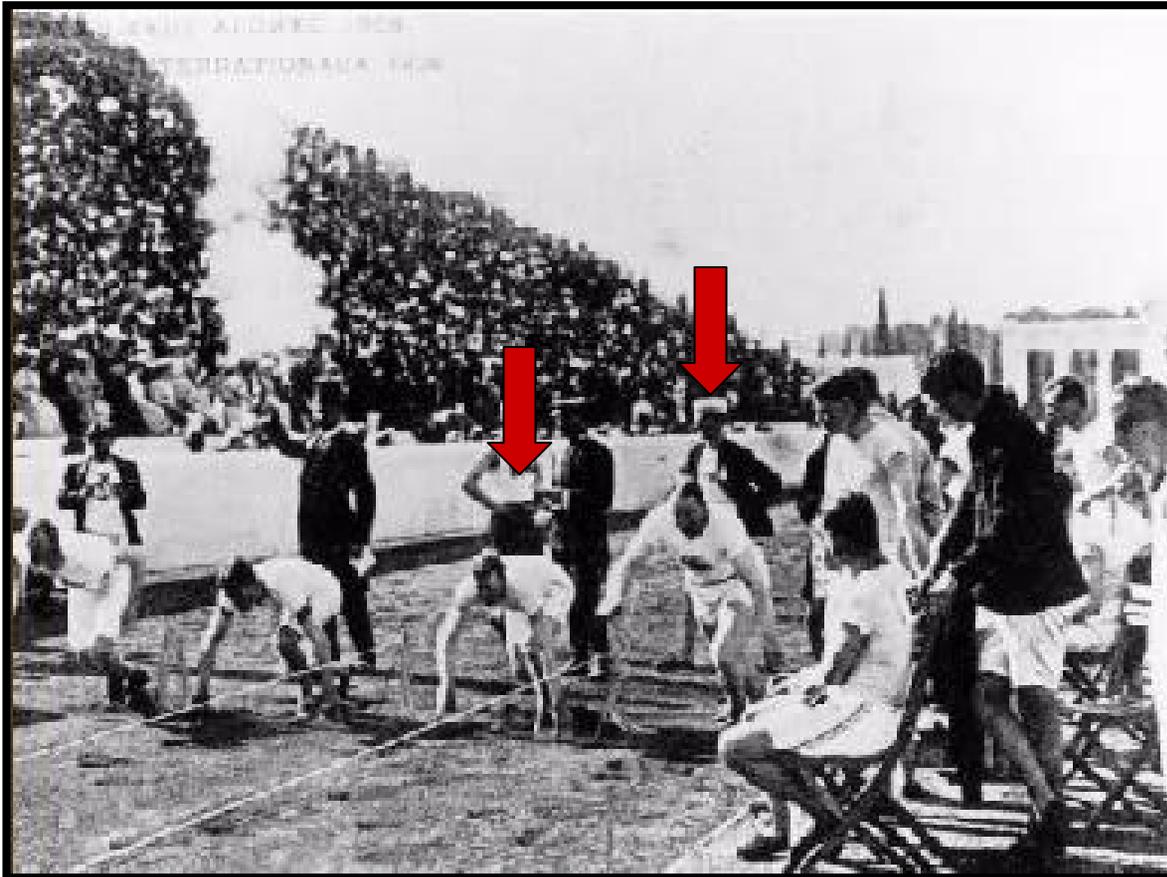


Vs.





Equilíbrio e estabilidade



J.O. 1906: final 100m



Equilíbrio e estabilidade



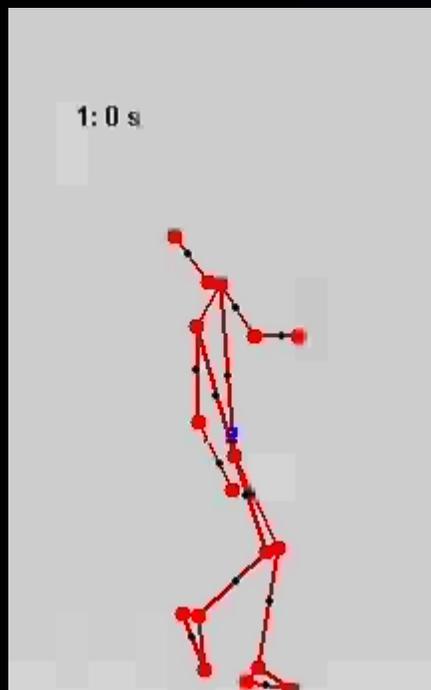
Maria Sharapova (RUS)



Cinemática



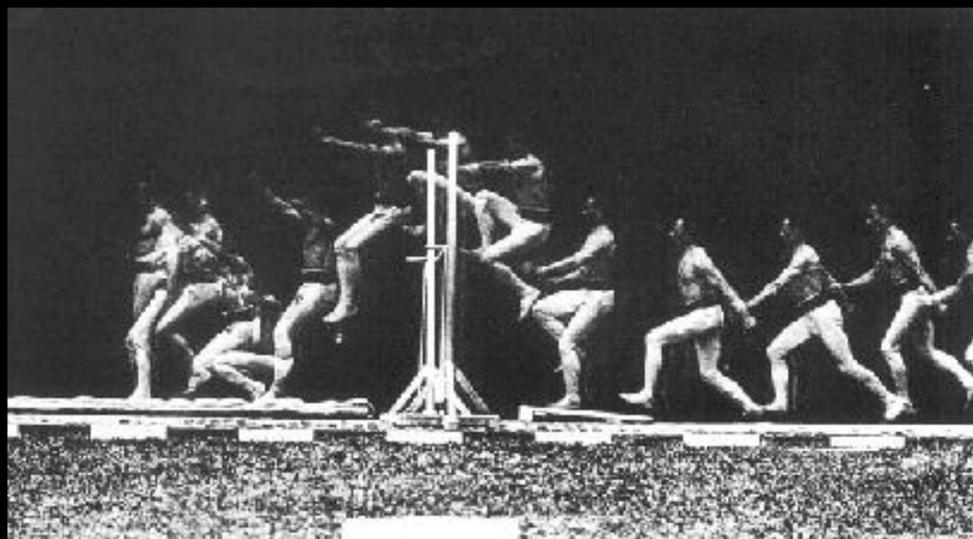
Trajectórias



(Duarte, 2002)

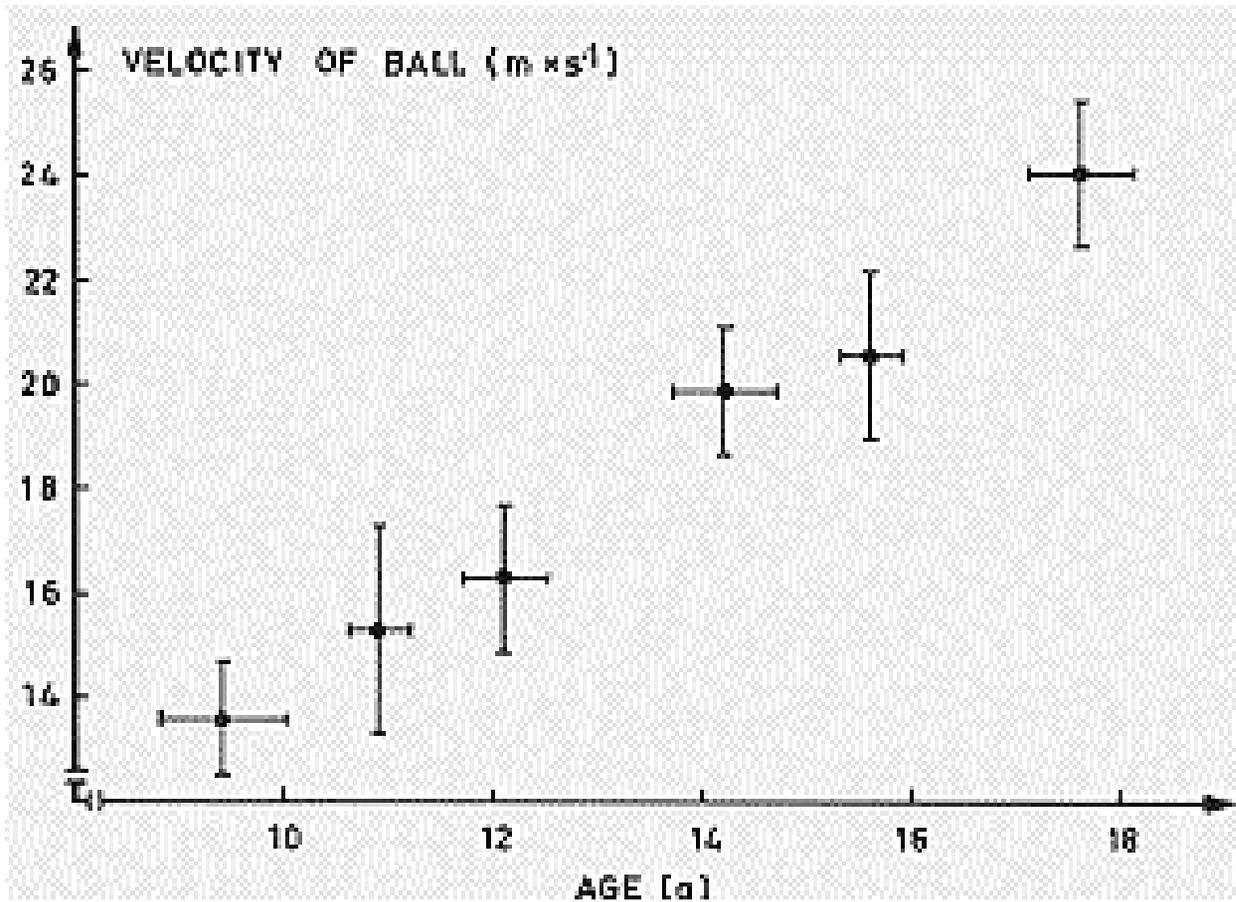


Trajectórias





Velocidade



(Luthanen, 1984)



Velocidade



Tchuto < TGR
0,358s < 1,025



Projécteis

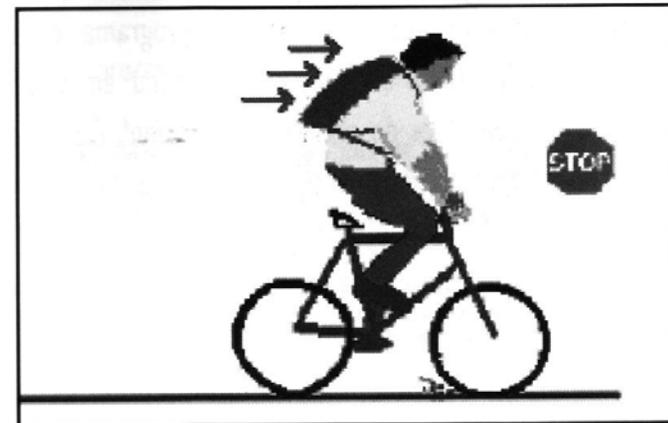




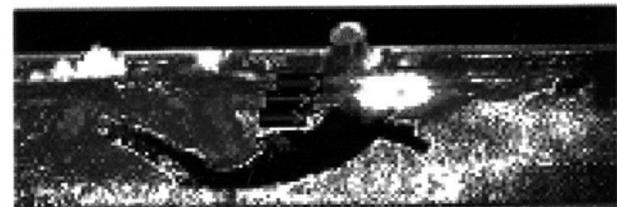
Cinética



Inércia



**comparable to the propulsive inertial effect
from a rucksack when decelerating**



(Silva et al., 2003)

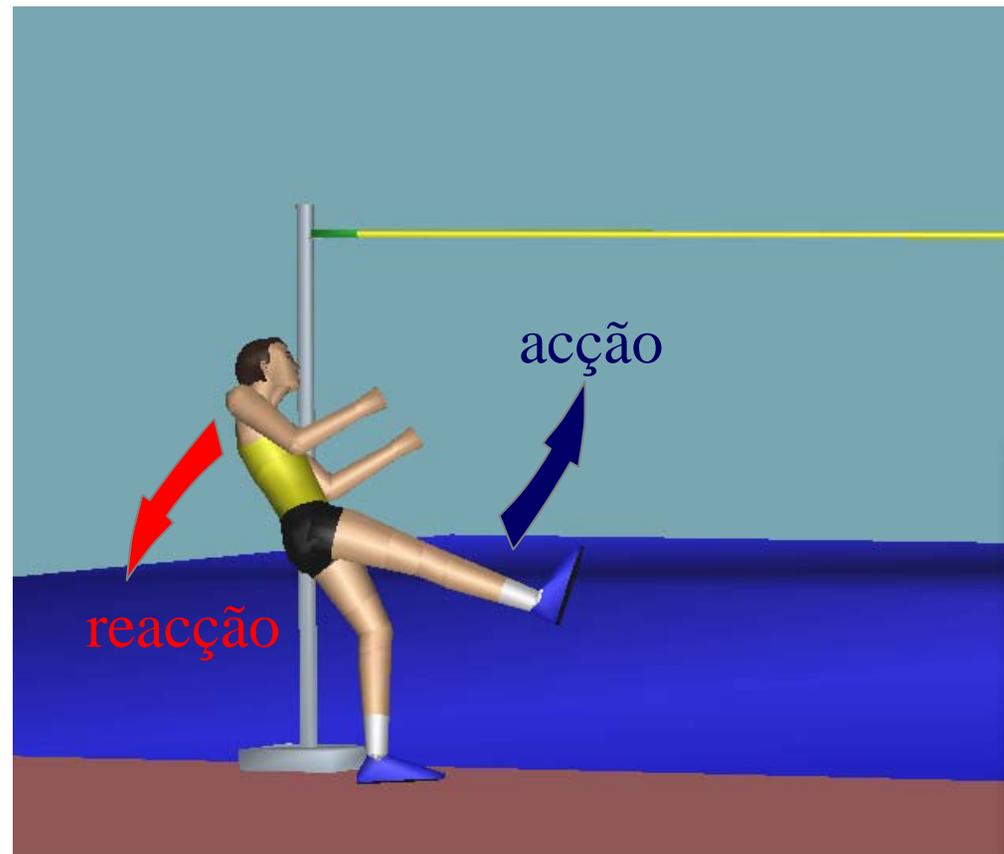
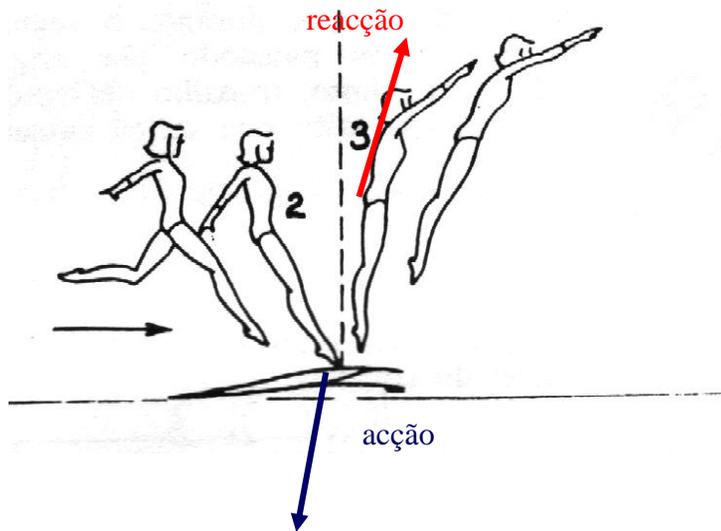


Aceleração



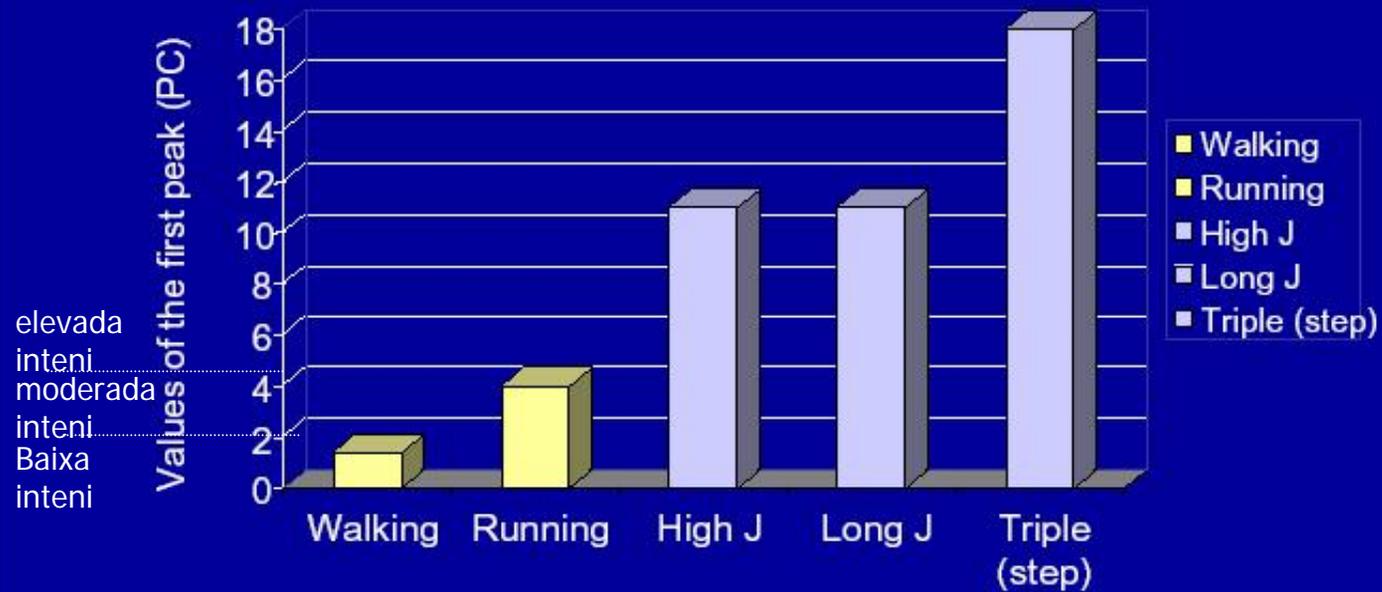


Reacção





GRF



Adapted from BAUMMAN & STUCKLE (1980)

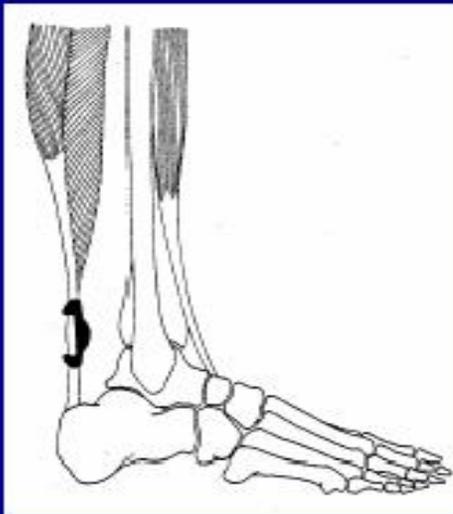


Forças internas

Dynamics

Assessment of internal articular forces

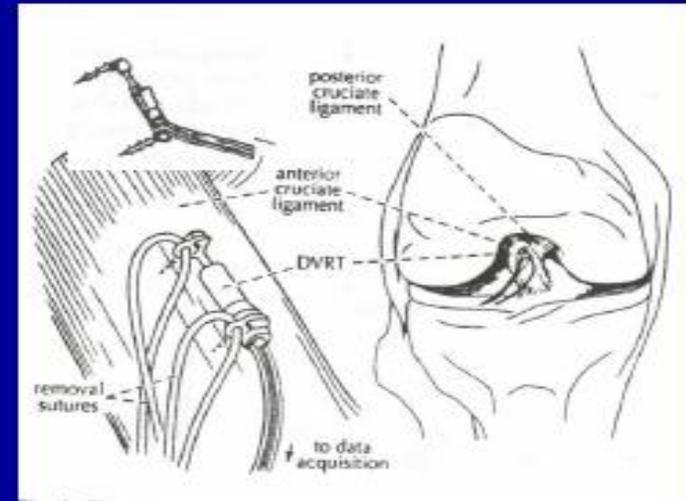
Invasive (direct) measurement:



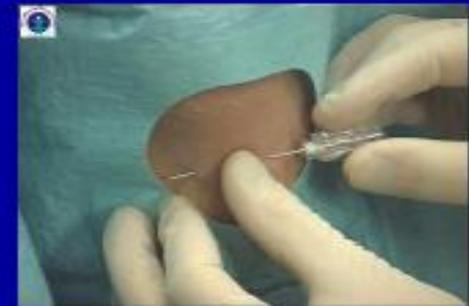
KOMI et al. (1987)



WILKE et al. (1999)



BEYNNON et al. (1997)



KOMI et al. (2004)

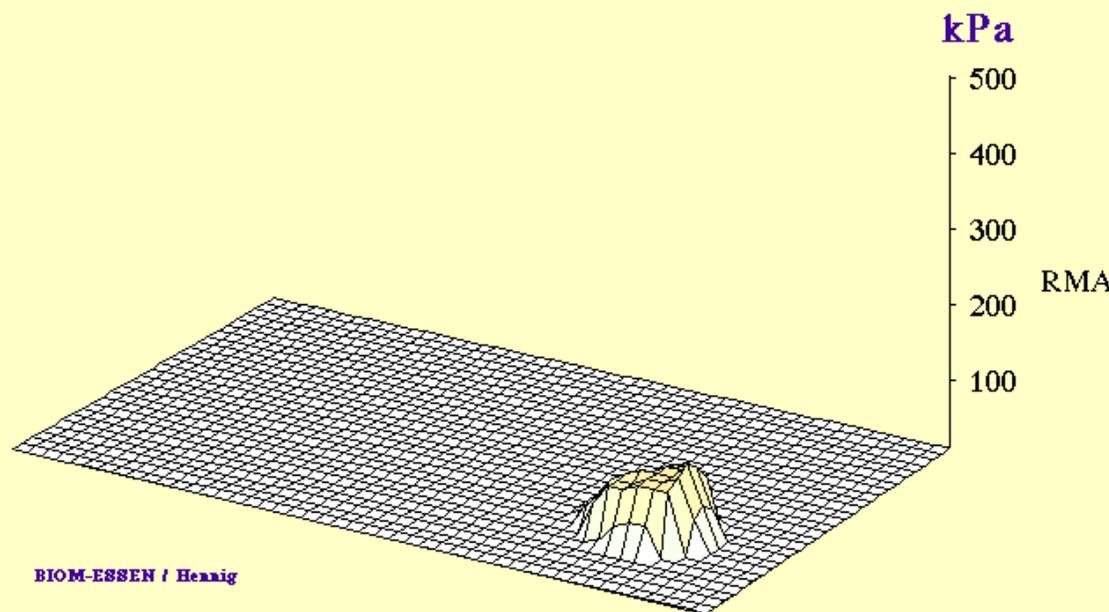


Quantidade de movimento





Pressão





Energia mecânica



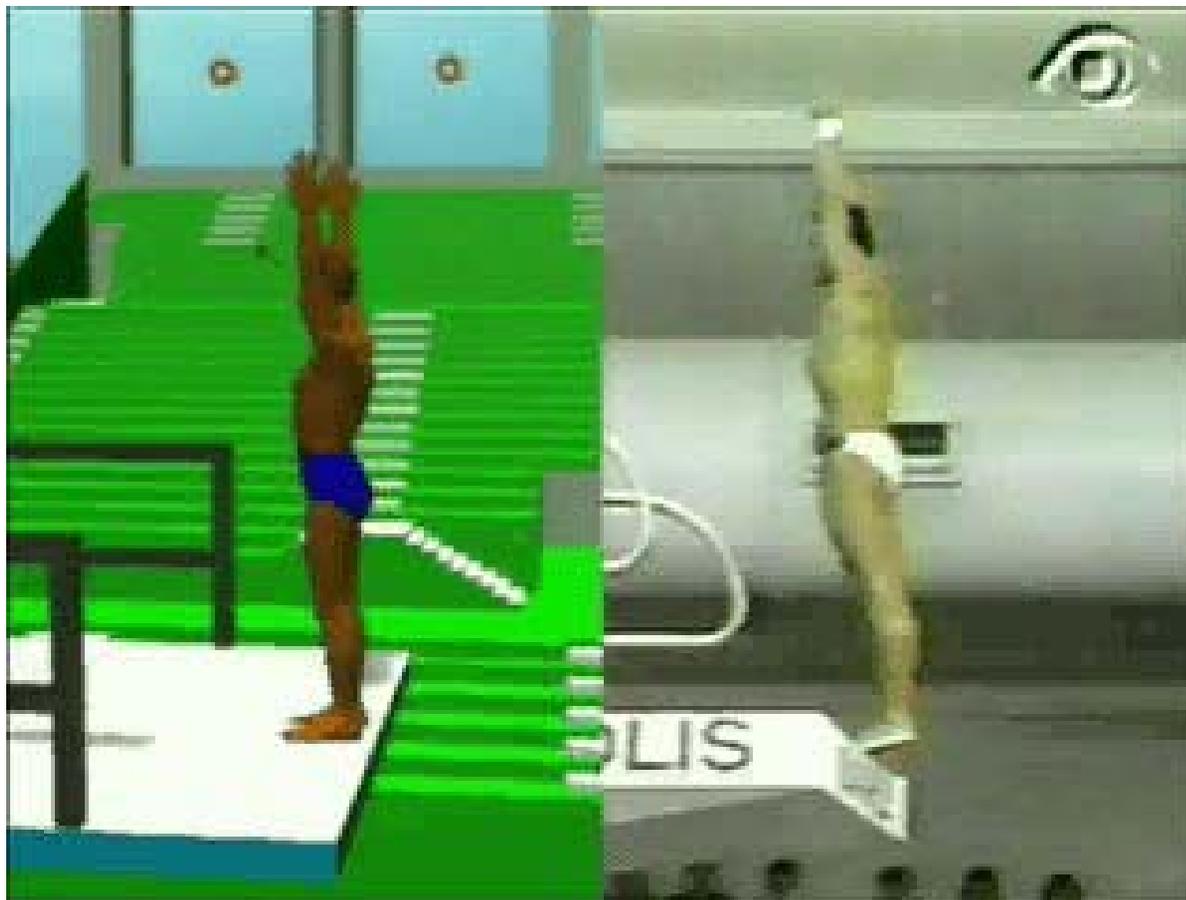


Energia mecânica



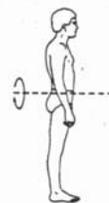
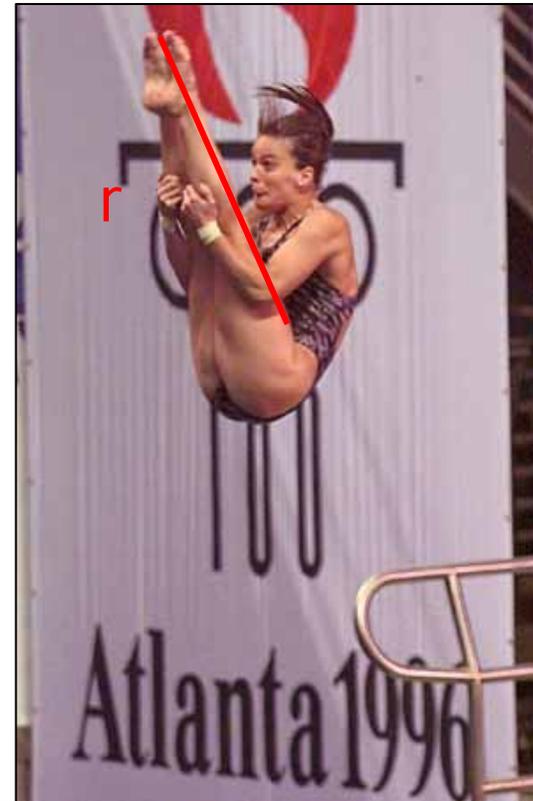


Momento de inércia

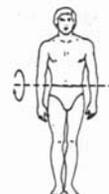




Momento de inércia



(1) Frontal
(2) 12,0-15,0



(1) Transverso
(2) 10,5-13,0



(1) Transverso
(2) 4,0-5,0



(1) Longitudinal
(2) 1,0-1,2



(1) Longitudinal
(2) 2,0-2,5



Momento de inércia

