

**USP - ICMC - SSC
SSC 0714 (RMA) - 1o. Semestre 2011**

**Disciplina de
Robôs Móveis Autônomos
SSC-0714**

Prof. Fernando Santos Osório
Email: fosorio [at] { icmc. usp. br , gmail. com }
Estagiário PAE: Gustavo Pessin - pessin [at] gmail.com
Web: <http://www.icmc.usp.br/~fosorio/>
Wiki ICMC: <http://wiki.icmc.usp.br/index.php/SSC-714>

Agenda:

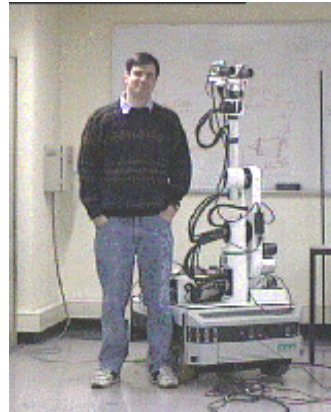
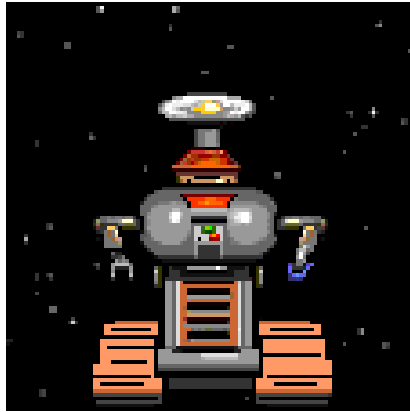
Robôs Móveis Autônomos:

- 1. História**
- 2. Tipos de RMAs**
- 3. Exemplos de Aplicações**
- 4. Desafios**
- 5. Futuro?**

Robôs Móveis Autônomos

Robôs Móveis Autônomos

Da ficção científica à realidade...



Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico

History Making Mobile-Robots - HM



(Not yet included in list - Stanford Cart, Xee, Hebot1.....)

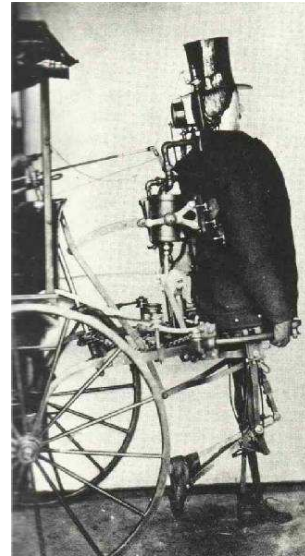
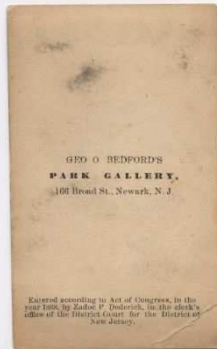
Significant Robots - and time-line events



Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico – 1868: A Steam Man
Mr. Zadock Deddrick¹, a Newark machinist,
has invented a man; one that, moved by steam,
will perform some of the most important functions of
humanity; that will, standing upright, walk or run...

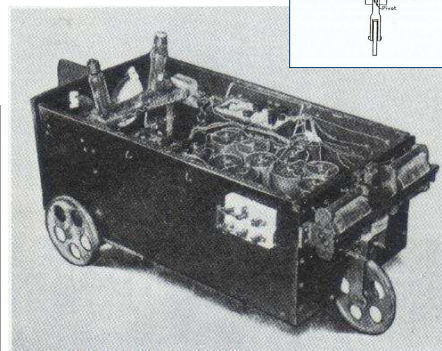
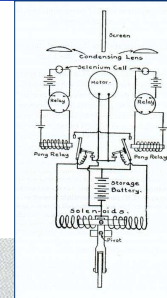


5
Março 2011

Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico – Electric Dog - 1912
An electric dog, the ancestor of all phototropic self-directing robots,
was designed in 1912 and constructed in the USA by researchers
John Hammond, Jr. and Benjamin Miessner



6
Março 2011

Robôs Móveis Autônomos

Robôs Móveis Autônomos

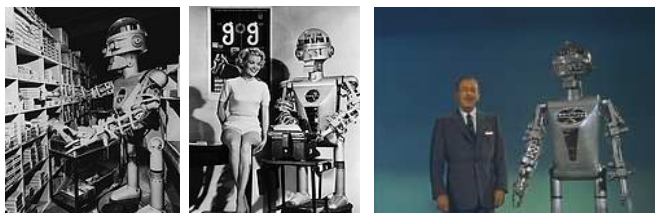
Histórico - 1944 - II World War - German Tank
Goliath (YouTube)
Human Controlled Vehicle
"Remote Control"



Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico - 1944: The robot Garco was created by Harvey Chapman.
The robot, built from discarded aircraft parts, is operated by remote control.
Human Controlled Humanoid - "Remote Control"



• Popular Science December 1953 - details of how Garco works



Robôs Móveis Autônomos

Robôs Móveis Autônomos

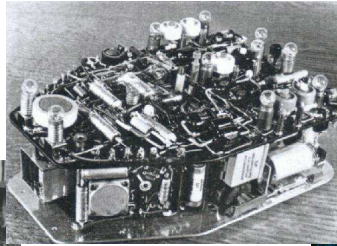
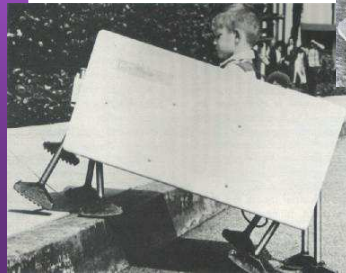
Histórico

1960: Zemanek build a series of robots to model combination of conditioned reflexes

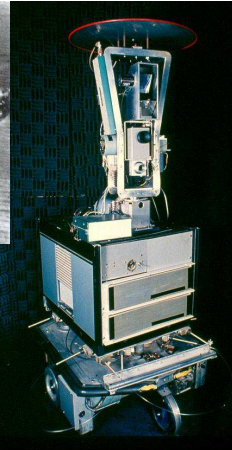
1965: Moonwalker - an 8-leg 'wheelchair' developed by Aerojet General for the University of California

1966: Shakey Shakey
Stanford Research Institute

Moonwalker



Zemanek



Shakey

11

Março 2011

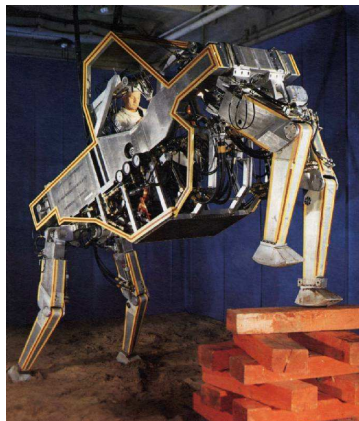
Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico:

GE Walking Truck 1968

The Walking Truck was developed by Ralph S. Moshier for General Electric under a commission in 1966 from the US Army.



David Ride 2000

12

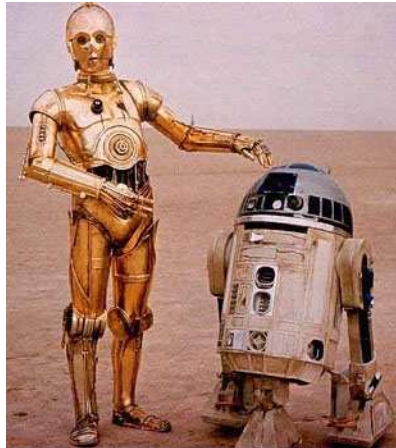
Março 2011

Robôs Móveis Autônomos

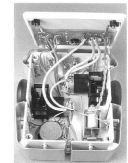
Robôs Móveis Autônomos

Histórico - Ficção Científica

1977 Droids - Film: Star Wars - R2-D2, C-3PO



1983: Zeaker
by David Buckley



1988: Shadow
Biped Walker
by David Buckley



Robôs Móveis Autônomos

Robôs Móveis Autônomos

Histórico

1989: Genghis - a 1Kg six legged robot which walks under **subsumption control** and has an extremely distributed control system.

Brooks, Rodney - MIT AI Lab



Robôs Móveis Autônomos

Histórico – 1996 Khepera (EPFL)

Khepera mobile robot [From Wikipedia]

The first generation Khepera robot released in 1996

The Khepera is a small (5.5 cm) differential wheeled mobile robot that was developed at the LAMI laboratory of Prof. Jean-Daniel Nicoud at EPFL (Lausanne, Switzerland) in the mid '90s. It was developed by Edo. Franzi, Francesco Mondada, André Guignard and others.

Small, fast, and architected around a Motorola 68331, it served researchers for 10 years, widely used by over 500 universities worldwide. It is now outdated, even with its upgraded processor and flash in version 2.0.

