Configuration of Robot with Environment (Kinematic) vs. Actuators

Robot Moves
Environment is Fixed

Mobile Robots

Walking
Run
Sprint

Locomotion

Types of Motion:

Locomotion

Lectures
For humans, \( N = 6 : B^D \; B_u \; R^D + L_u \; R_u + L \).

Get control by synchronizing sequences by legs.

More complex than towers:

- 3D on equal legs (in pose).
- Balance - Static Stability (stable/dynamic).
- Complexity - Mechanical & Control.

Disadvantages:
- Power consumption.
- Conversion of \( u \) to the ground.
- No "continuity" at join points.

Advantages:
- Add adaptability & mobility.
- Leecher Mobile Robot.
Springs
Forces acting on bodies:

Friction as backforce motion

Which is 8 as in energy method

\[ RU + LD \rightarrow RU + LD \]
\[ RD + LU \rightarrow RU + LD \]
\[ RU + LU \rightarrow RD + LU \]

Continued...
KALIST ROBOT ( painstaking)

DAREA CHALLENGE 2015

2 * 2.6 meter
40 degree

3) MAEBRIAL - 2R 64 KG 1.55m

2) Aonan R2 210 KG 1.82m

4) 2.6 + 2*6 + 2*7

28 degree: (N+B+L)
11.9 - 8.8cm

2x7 = 2x7

Sorry Sir ( Sony Bean Robot)

One leg - 

Leees Robots
Four legs: Sony Aibo (dog)

Six legs:
- Boston Dynamics
- Cheetah
- ATLAS
- HexaPod
- NAO (Germany)

Two legs:
- Humanoid
- Big dog
- Little dog
Wheel Robot

Geometry, Stability & Maneuverability

Type: Stowable 2D; Casters; 3D of

Two Free + Torque + Translation

Traction / Steering

Airplane

Secure

Bicycle
\[
\begin{bmatrix}
0 & 1 \\
0 & 0 \\
-\sin \theta & \cos \theta
\end{bmatrix}
R(\theta) = \mathbf{Rot}(\theta)
\]

Kinematic Models

Refer to textbook
What motion
was issued as
the target?

\[ \theta = 0 \]
\[ \dot{\theta} = 0 \]
\[ v = 1 \text{ m/s} \]
\[ \dot{x} = 1 \text{ m/s} \]

Of constant velocity. 

A box is moving towards I

\[ a_2 = 0 \]

(\text{as opposed to} \ a_1)

\[ \frac{1}{2} \rho (\theta) \]

Motion of \( \theta \): 

\[ \theta = \frac{1}{2} \rho \]
The constraint of robot wrist, forearm, and hand (kinematic):

\[ x, y, \theta \in \mathbb{R}^3 \]

Combined with actuator constraints (dynamic):

So, again, we must read the kinematic equations, or:

"Which #2 by that much".

For example, we actually say:

\[ \theta(t) \]