qb robotics

fast, flexible technology

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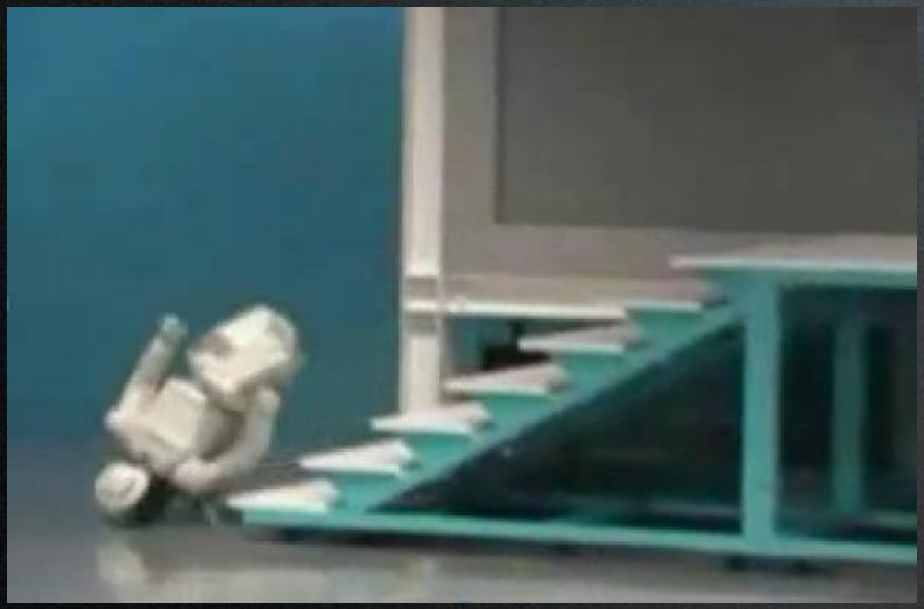
Robotics I

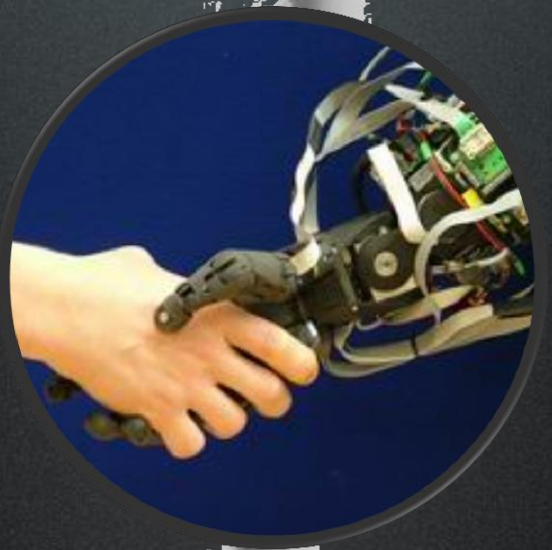
Robotics | Dream & Reality



Robotics | Dream & Reality

challenges:

- H-R Interaction
- safety for Humans
- safety for Robots
- energy efficiency
- dealing with unstructured environments
- …



toward solution:

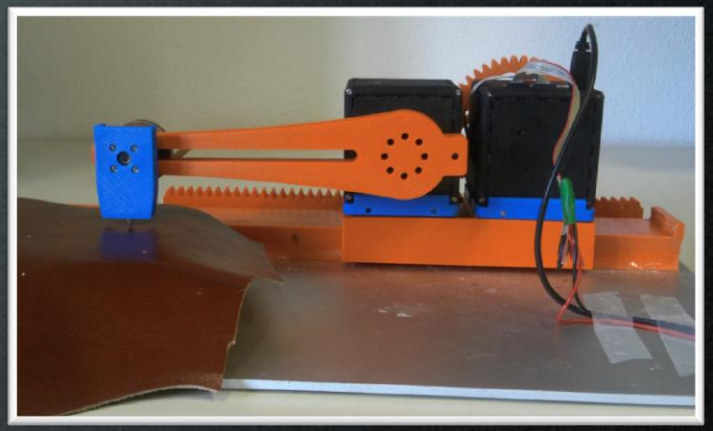
soft robotics

qbmove

- The Natural Motion™ actuator (VSA) you can download and build yourself
- Three versions (completely Open SW/HW):
  - Maker, Maker-pro, Advanced
- Easy control interface:
  - Use like a servomotor
  - Control mechanical equilibrium position and stiffness
  - Seamless integration in C, Simulink, ROS
- On-board sensors read, control and transmit internal configuration data and position of the output shaft

qbmove:
faster than you'd think

- Elasticity in an actuator can be used to increase the dynamic range of the actuator output – in this example, to repeatedly punch and cut a leather sheet



- The application (cutting a thick leather sheet) call for higher velocities than the motor could provide
- Here we fix inertia and stiffness value, and shape the equilibrium point input to oscillate the blade at resonant frequency


We are not cutting yet

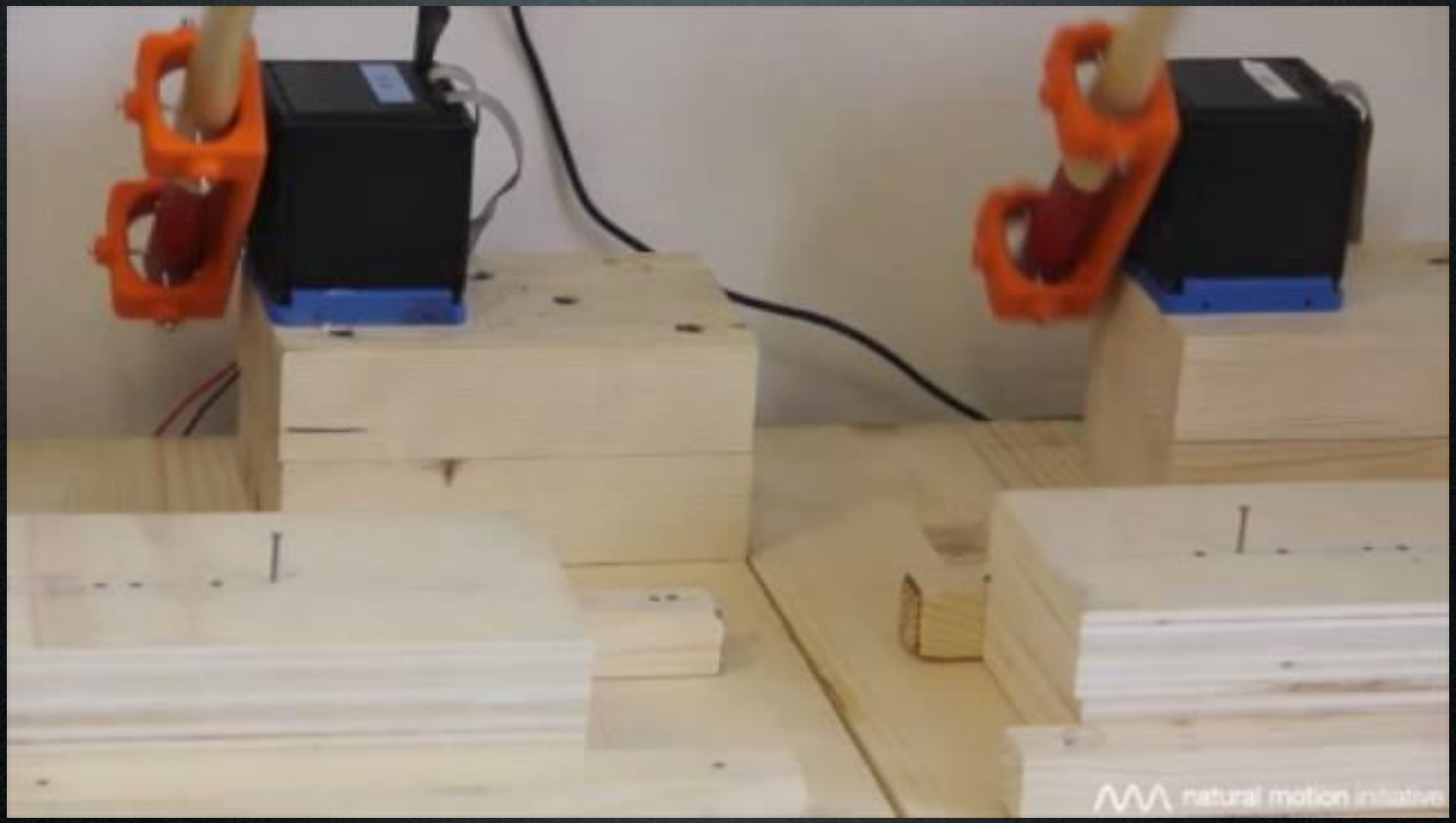

natural motion

qbmove hammer: strong & robust

People are not stiff
while hammering a nail:

- reduce the musculoskeletal stress
- allow tool velocity to increase beyond that of voluntary movements
- use energy storage and release to increase efficiency

qbmove hammer: strong & robust

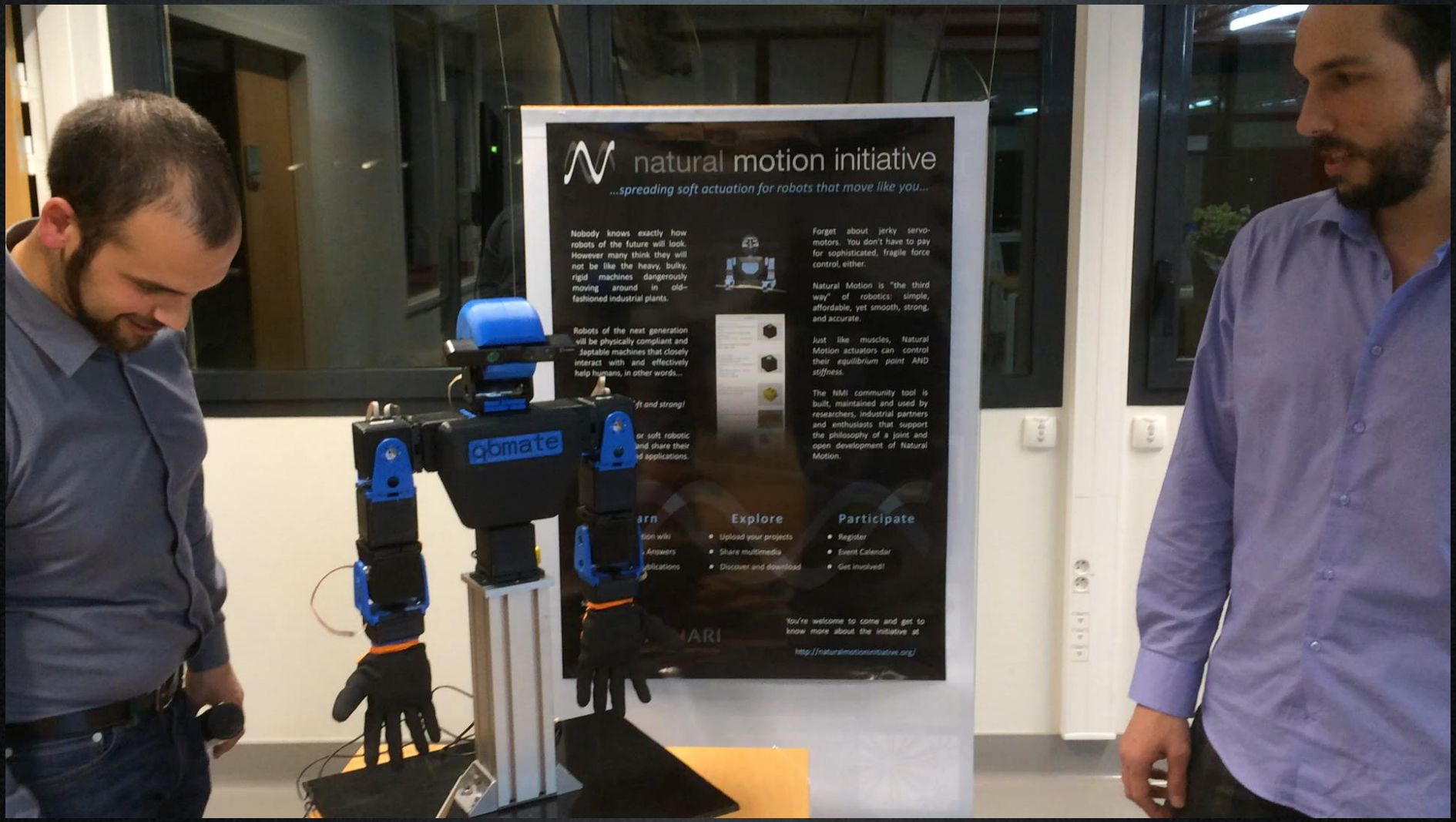


qbmoves are building blocks

- *qbmoves* are modular and easy to combine
- can be combined to build *qbmates:* imagination is the limit!

Examples:

- a *qbmate* snake
- …hexapod
- …biped
- …or torso


natural motion initiative
...spreading soft actuation for robots that move like you...
Nobody knows exactly how robots of the future will look. However many think they will not be like the heavy, bulky, rigid machines dangerously moving around in old-fashioned industrial plants.
Forget about jerky servo-motors. You don't have to pay for sophisticated, fragile force control, either.
Natural Motion is "the third way" of robotics: simple, affordable, yet smooth, strong, and accurate.
Just like muscles, Natural Motion actuators can control their equilibrium point AND stiffness.
The NMI community tool is built, maintained and used by researchers, industrial partners and enthusiasts that support the philosophy of a joint and open development of Natural Motion.
Explore
Upload your projects
Share multimedia
Discover and download
Participate
Register
Event Calendar
Get involved!
You're welcome to come and get to know more about the initiative at
http://naturalmotioninitiative.org/
gbmate

qbmove & qbmate

- development is promoted by the European project

www.saphari.eu

- all design (hardware, electronics, software, etc..)

  are **open** and **free** to download and replicate from:

www.naturalmotioninitiative.com

- **ready-made** *qbmove* units and *qbmate* kits from:

qb robotics

www.qbrobotics.com

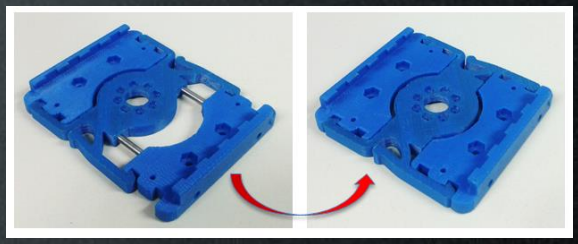
qbmove

- Maker
- Maker-pro
- Advanced

QB Move	Standard	Developer*	Avaiability
QB Move Maker	640 €	400 €	Order Now
QB Move Maker Pro	960 €	600 €	Order Now
QB Move Advanced	1600 €	1000 €	Early 2014

qbmate

- Starter kit
- Full kit
- Advanced kit

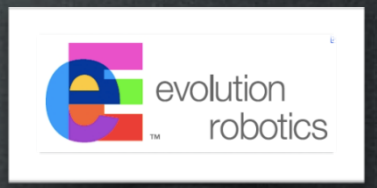


Kit	Standard	Developer*	Avaiability
QB Mate Starter Kit	6400 €	4000 €	Order Now
QB Mate Full Kit	12800 €	8000 €	Early 2014
QB Mate Advanced Kit	19200 €	12000 €	Early 2014

robotics research institutes

$873M/year

$55M/year



$4.7M/year

competition teams	research institutes	total
23.3M€	17.6M€	40.9M€ / year

$26.9M/year

founded in 2005
100+ employees
€100M+ of investments

$ 9.526 billion/year

$147.4M/year

market analysis | big companies...

Break even point

- Our analysis gives a 120K€ BEP on a 3Y projection
- Corresponds (roughly) to 0,3% of a market volume of 40M€
- At the present stage, most of it covered with our current SAPHARI-related commission

Fixed Operating Costs	56.915
Deprecations	2.551
Total Fixed Costs	**59.466**
Gross Revenue	162.266
Cost of Sales	82.071
Gross Margin	**80.195**
Breakeven Sales level	**120.323**

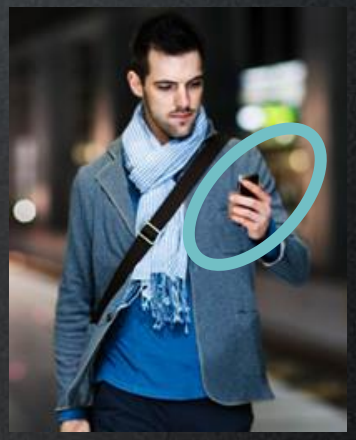
But… is this all? …of course not!


LOOK AT THE FULL LANDSCAPE

Robotics I

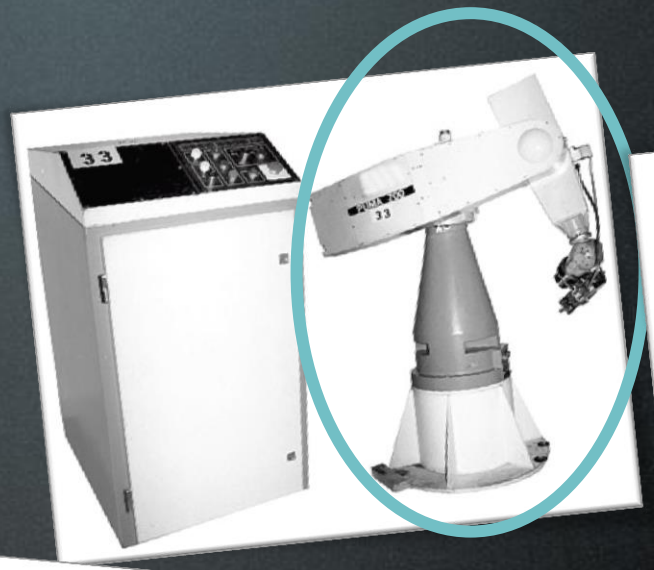
Robot Intelligence

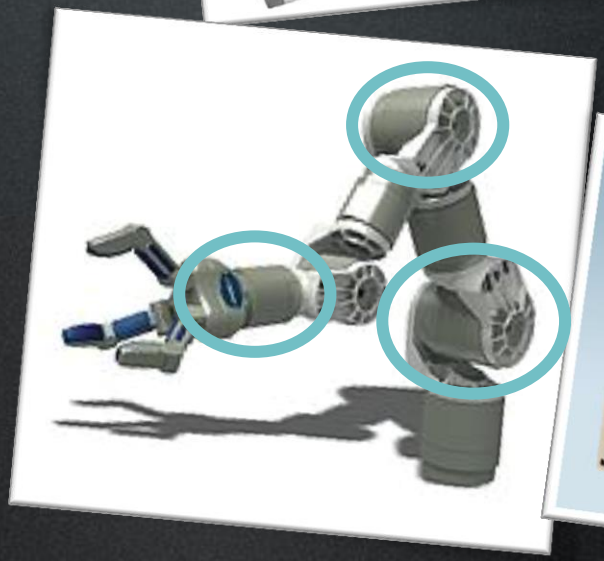
- Yesterday: Puma
  - Motorola 68K
  - 8 MHz
  - 160 Kflops
- Today: smartphones
  - Snapdragon S4
  - 1.5 GHz
  - 6.4 Gflops



Robot Motion

- 1960’s robotics
  - Unimate Puma
  - Servomotors
- 2010’s robotics
  - Servomotors

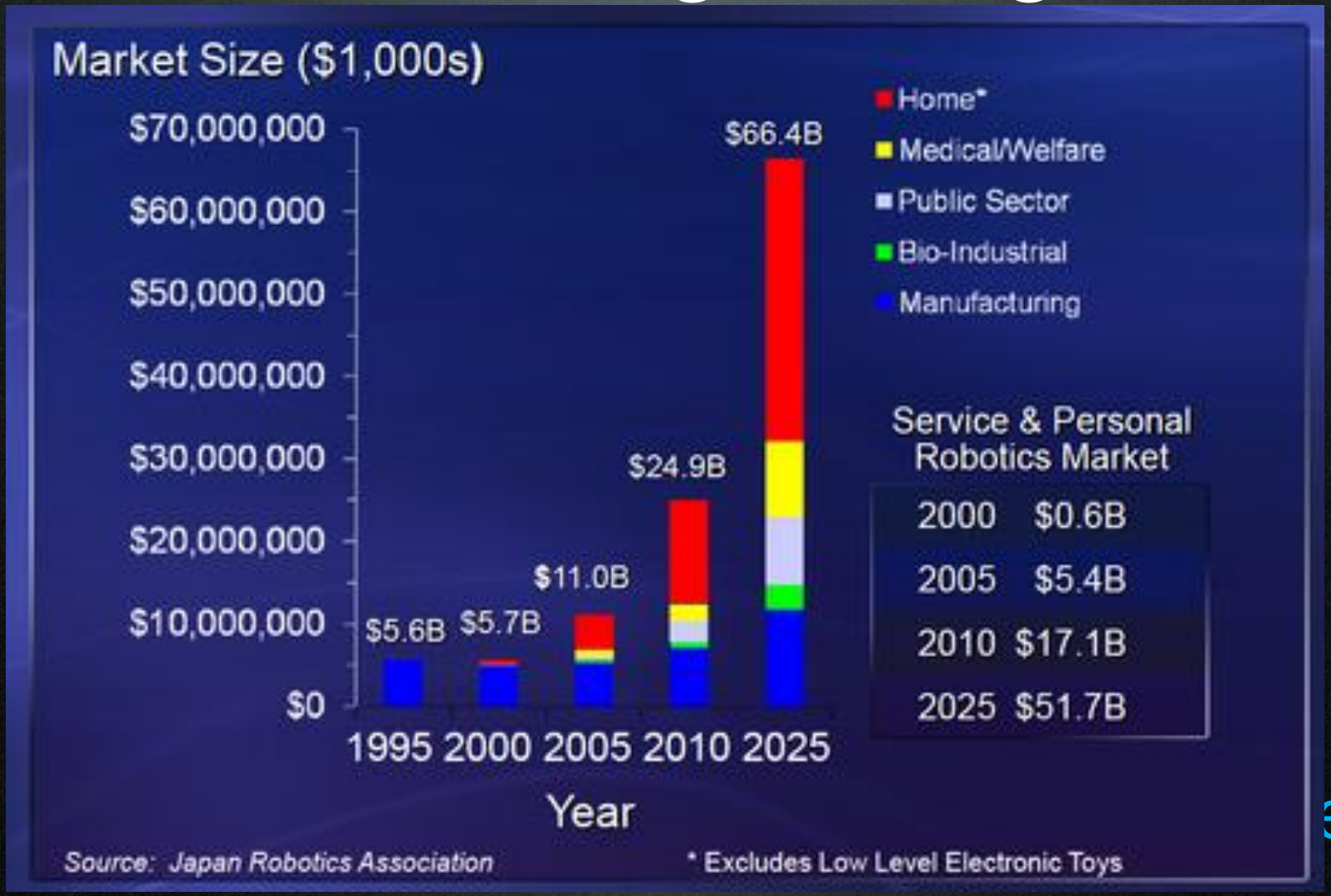




True Goal of qb robotics

- To bring the advantages of natural motion in the light of the sun
- Natural motion technology will lead to a new generation of high-performance, adaptable and flexible **manufacturing** robots
- … and will pave the way to **service robotics**
- **Natural motion** is going to be the **next paradigm shift** in **robotics**
- Our freshly granted **patent** (EU, soon US) covers **natural motion servomotors**

Mid and long term goals



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