



Bio-Mechatronics

Prepared by:
László Szűcs
(SWXDSX)

Introduction

- Born in 1993, in Cegléd
- Student of Óbuda University, Dónát Bánki Faculty of Mechanical and Safety Engineering
- Former Secondary School: Fáy András Technical Secondary School, Car mechanic,



What is Bio-Mechatronics?

Helping the
disabled

Endurance

Strength

Health care

Limb Movement

Types of Bio-Mechatronic

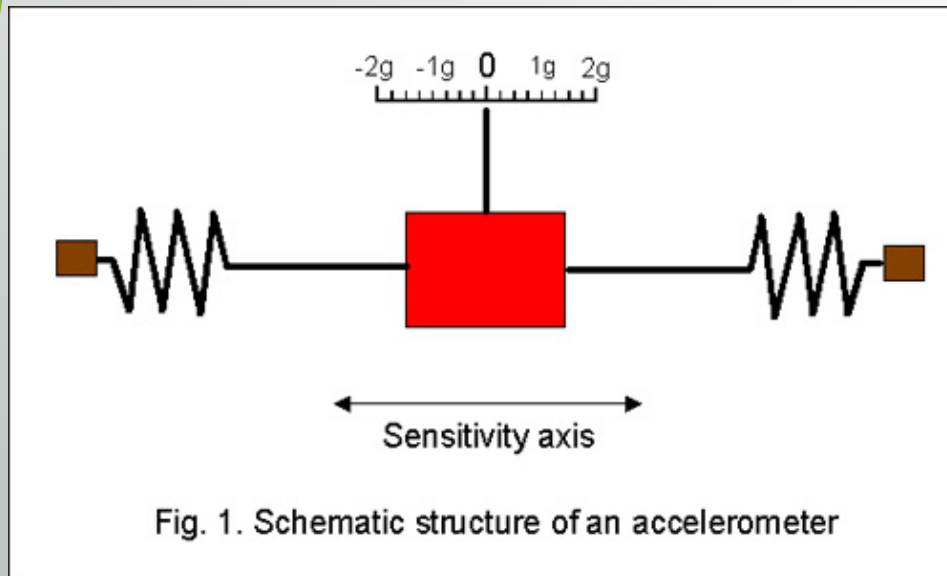


Prosthetic



Orthotic

Sensors in Bio-Mechatrical Systems (Bio-Sensors)

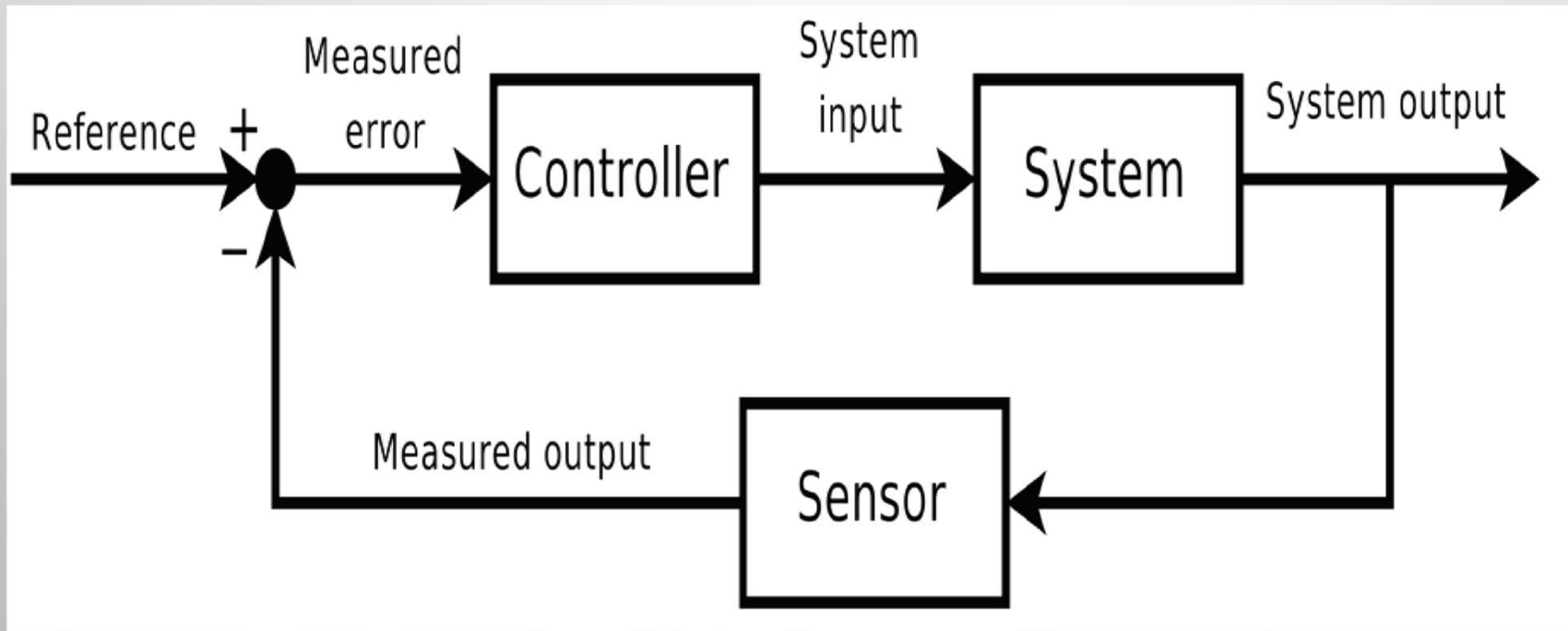


Accelerometer

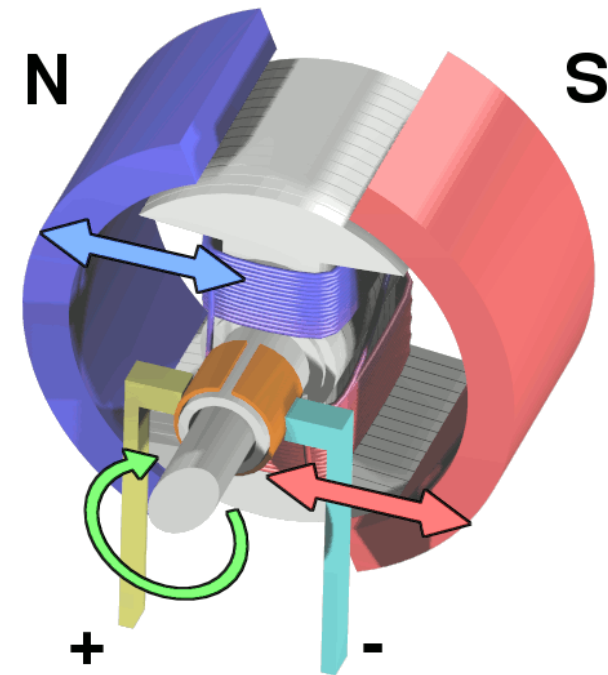
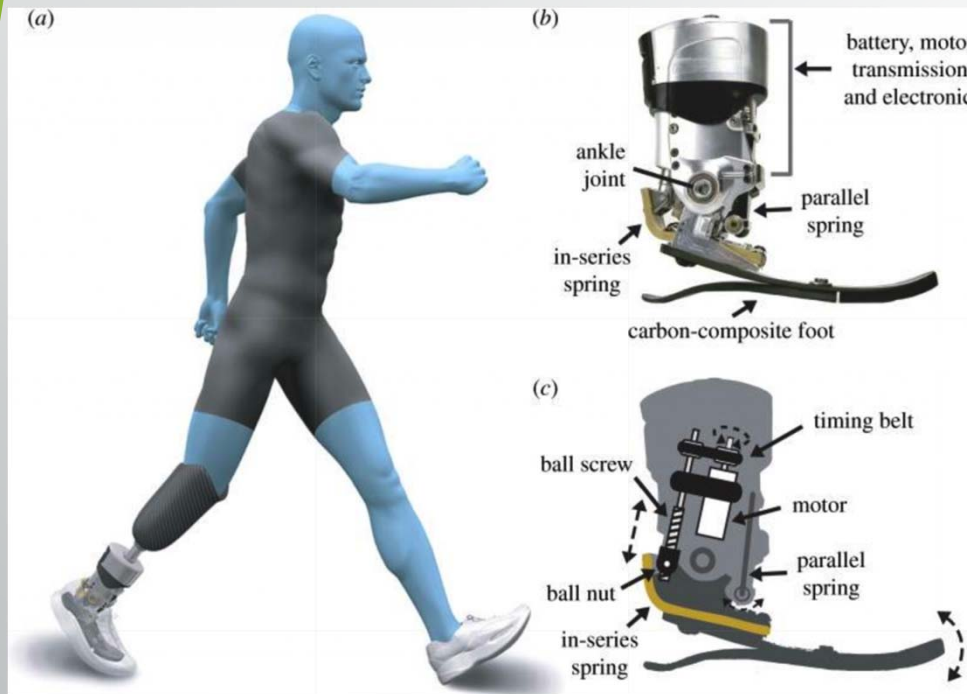


Bio-Sensor

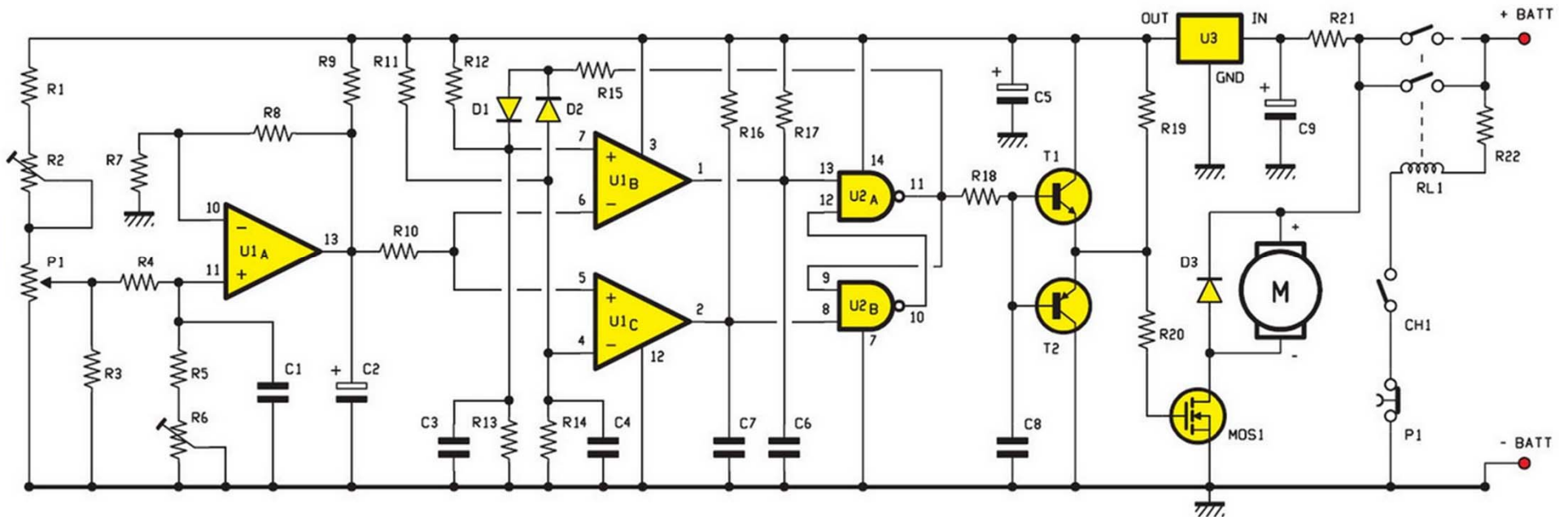
How Bio-Sensors work?



Actuators



Controllers





The previous researches

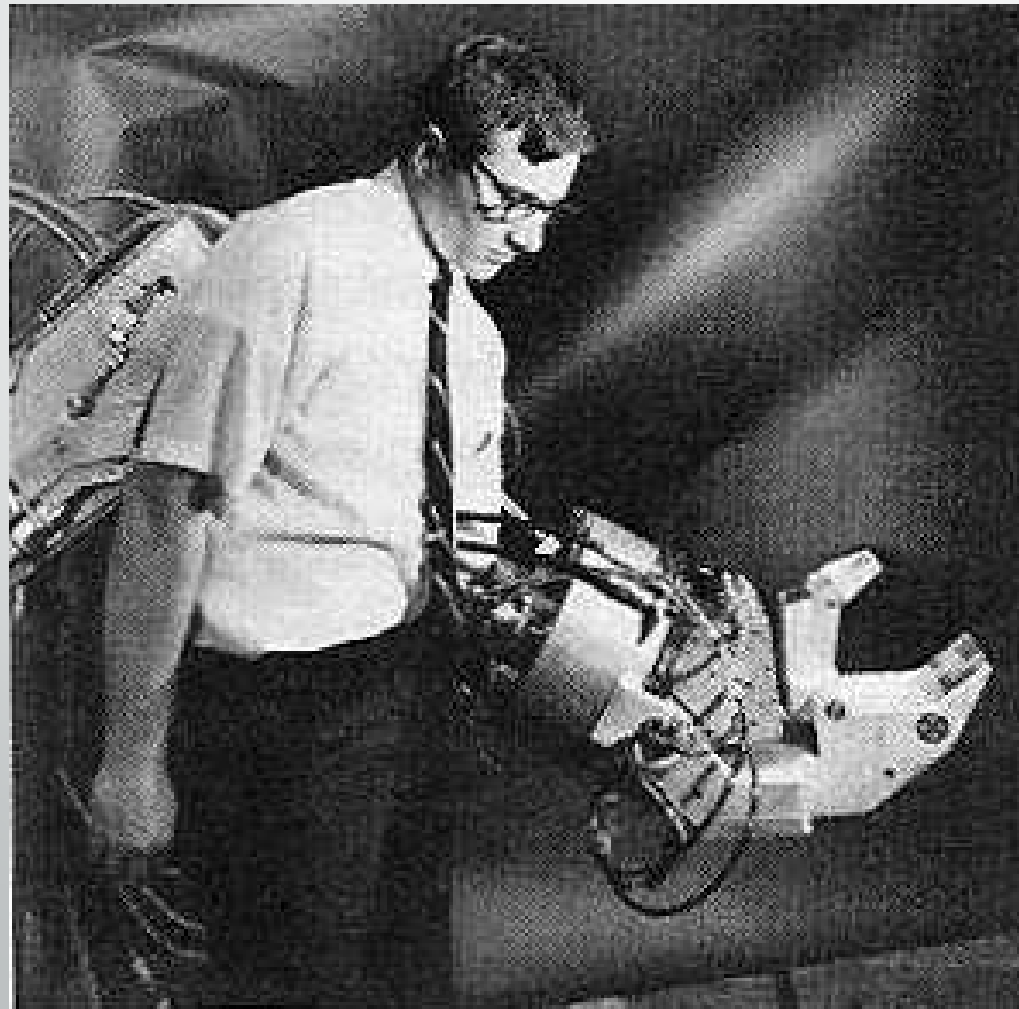


Mr. Hugh Herr



Raytheon's XOS-2 Suit

Past Research of Bio-Mechatronics in Exo-Skeleton



History

1890

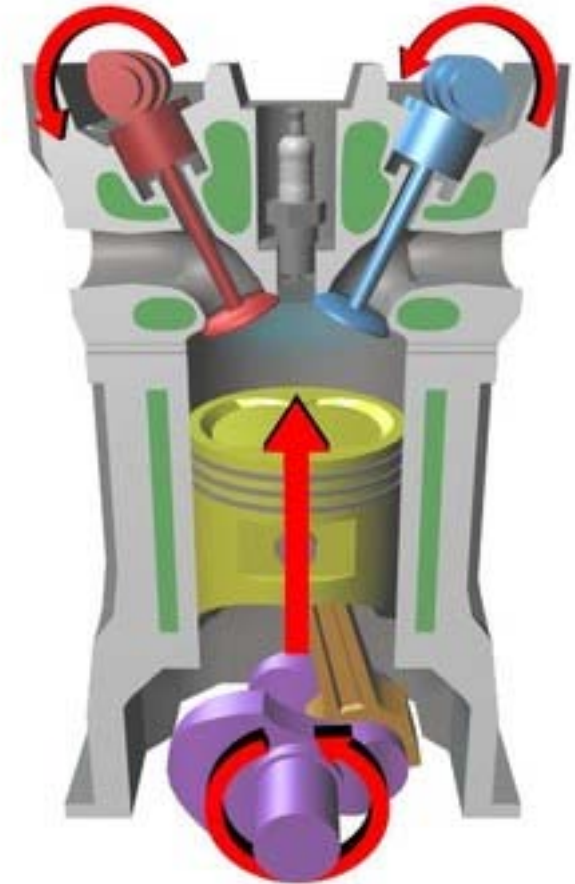
Slow reaction
time

Too heavy

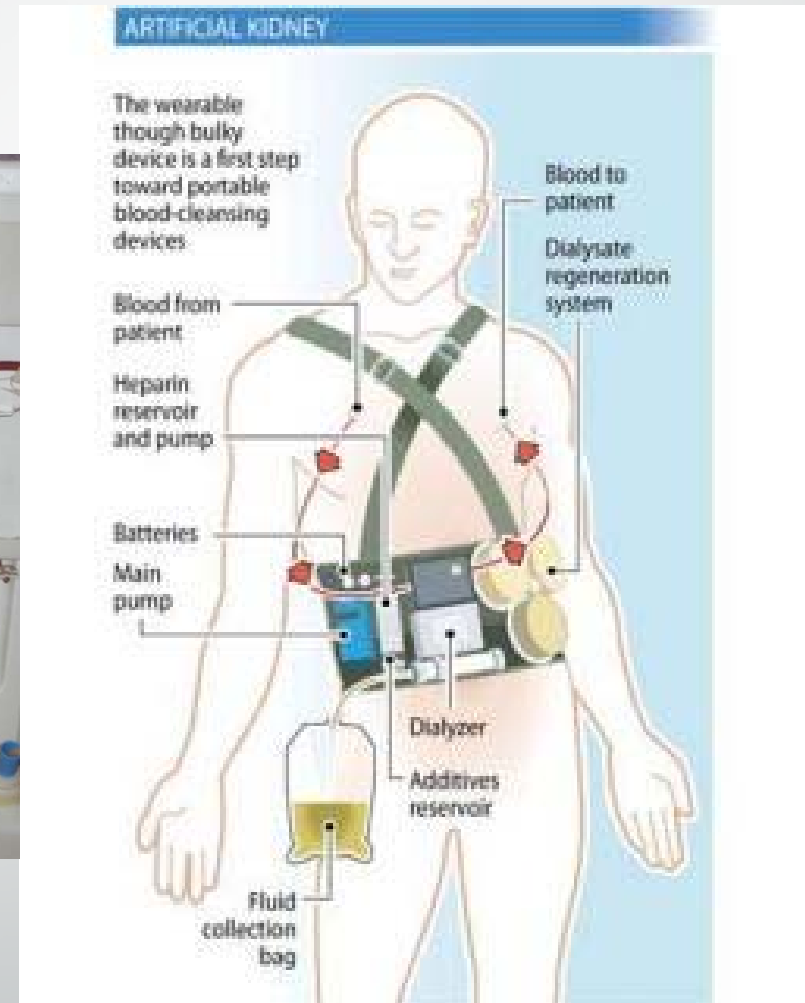
Never Tested With a
Human inside it



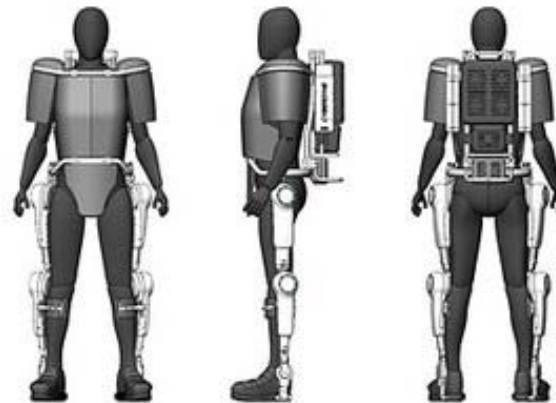
Key components and Limitations



Commercial Use



Commercial Use Up to date: H.A.L.



Cooling system equipped with radiation shielding

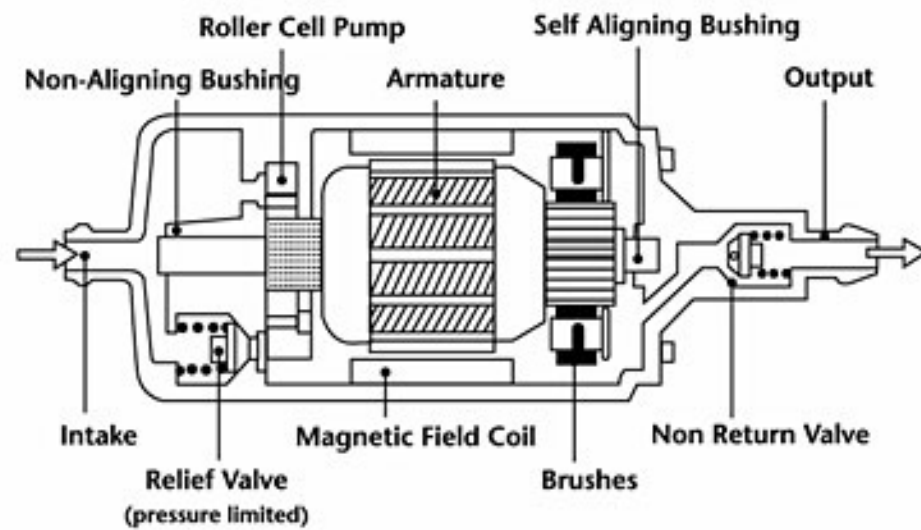



Vital sensor

Military Use



XOS-2





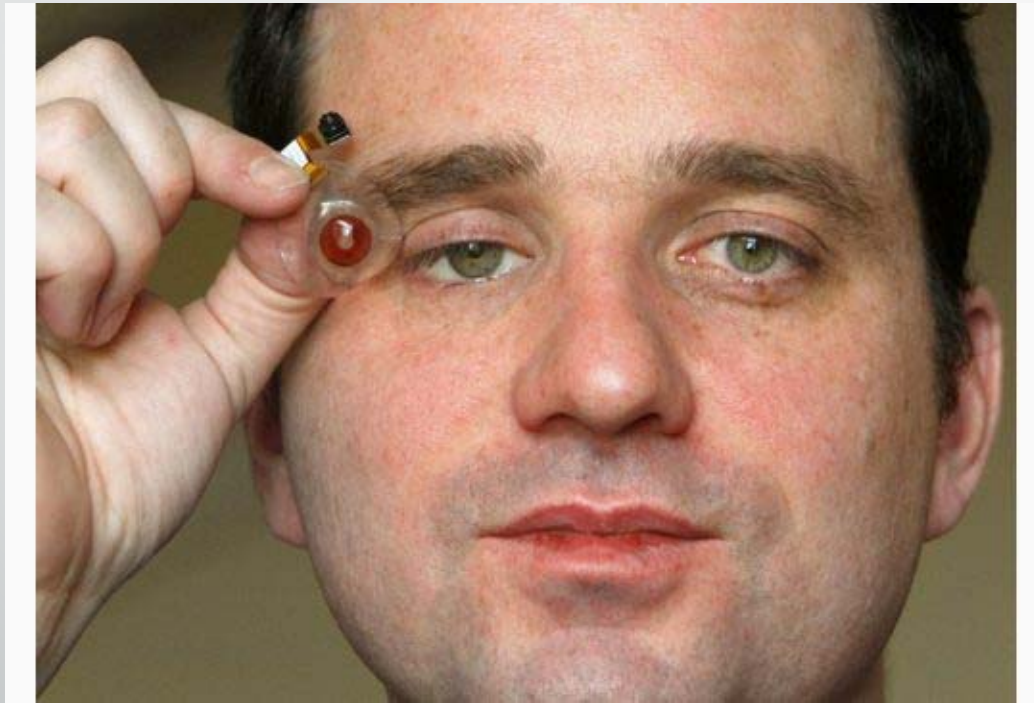
Future of Bio-mechatronics

- Clothing
- Optogenetics
 - Ear Drums for the deaf
- And many more...

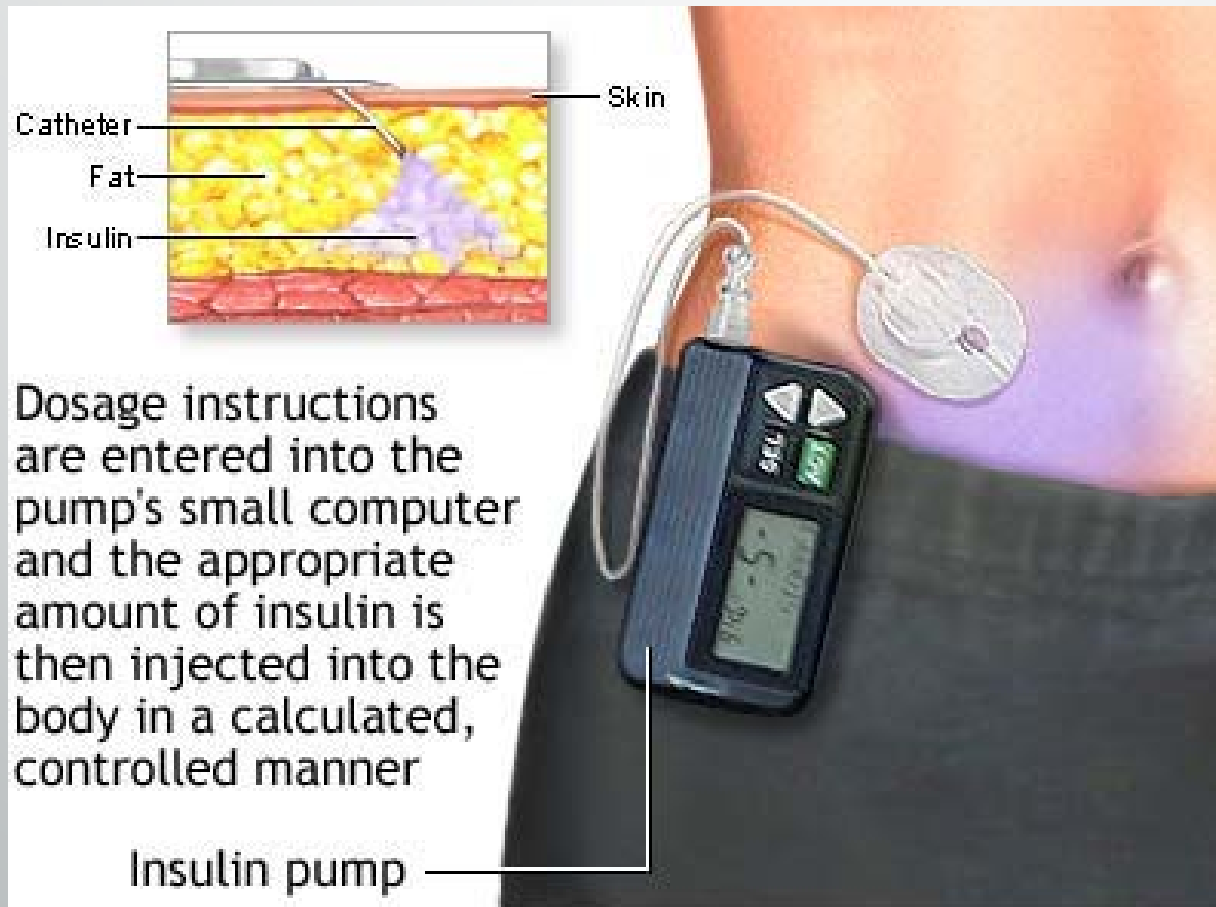
Artificial Muscles



Eye Like Cameras for the Blind



Internal devices for diabetics



Dosage instructions are entered into the pump's small computer and the appropriate amount of insulin is then injected into the body in a calculated, controlled manner

Technology of the future



Sources

- http://www.python-injection.com/electric_fuel_pump.php
- <http://www.atlaschiropractic.ca/nanaimo-orthotics.html>
- http://biomech.media.mit.edu/portfolio_page/powerd-ankle-foot-prostheses/
- <http://prezi.com/g6isow-lgdas/biomechatronics-future-implications-on-humanity-and-society/>
- <http://www.authorstream.com/Presentation/aSGuest46318-403142-biosensors-bio-monitoring-ppt-education-powerpoint/>
- <http://techcrunch.com/2009/07/08/cyberdyne-corp-starts-exporting-its-robotic-exoskeleton-hal-5-video/>
- <http://pennstatehershey.adam.com/content.aspx?productid=10&pid=10&gid=000009>
- http://electronica.mk/all_articles/Electric_Car_Projects/Electric_Scooter_Speed_Controller/Electric_Scooter.html
- <http://inventors.about.com/od/estartinventions/a/Exoskeleton.htm>
- file:///C:/Users/cptja_000/Desktop/Suli/Introduction%20to%20mechatronic%20engineering/Project%20Work/Future%20Wireless%20Technology%20-%20worldbesttechnology.htm
- <http://playfoundation.net/2010/10/get-to-know-mits-hugh-herr/>
- <http://davidszondy.com/future/robot/hardiman.htm>
- <http://science.howstuffworks.com/biomechatronics1.htm>
- <http://www.edn.com/electronics-blogs/design-rx-blog/4412828/Hugh-Herr-keynote-at-DESIGN-West-2013-and-biomechatronics--Miracle-or-MIT-brilliance>
- <http://futuristicnews.com/hybrid-assistive-limb-exoskeleton-will-help-in-case-of-nuclear-disaster/>
- <http://www.lockheedmartin.com/us/products/hulc.html>
- <http://singularityhub.com/2010/01/28/lockheed-martins-exoskeleton-to-get-more-power-video/>
- http://biomechatronics.engineering.asu.edu/?page_id=39
- <http://www.army-technology.com/projects/raytheon-xos-2-exoskeleton-us/>
- http://www.thestar.com/entertainment/2009/03/11/smile_youre_on_eyesocket_camera.html
- <http://www.technobuffalo.com/2012/11/25/terminator-tech-cool-robotic-arm-types-ties-knots-and-cracks-eggs/>
- <http://www.gereports.com/the-story-behind-the-real-iron-man-suit/>
- <http://www.businessinsider.com/this-bionic-exoskeleton-can-give-you-superhuman-strength-2013-7>
- <http://lucyslab.ac.be/gendes/actuators/muscles.htm>
- <http://astounds.com/walking-paraplegics-and-super-human-strength/>



*Thank you for your kind
attention!*