Heaven's light is our guide

Rajshahi University of Engineering & Technol

MTE 1101

Mechatronic Systems

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Outlines

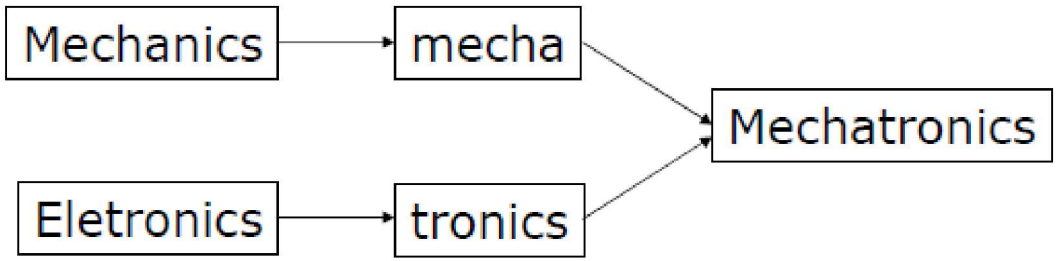
- Mechatronics History
- Mechatronics Definition
- Mechatronics Engineering
- Difference Between Electro - Mechanical system and Mechatronics System
- Applications of Mechatronics Engineering
- Class Work

Reference: Slide, Internet, Recommended Books

Mechatronics History

Mechatronics Defined — I

- "The name [mechatronics] was coined by Ko Kikuchi, now president of Yasakawa Electric Co., Chiyoda-Ku, Tokyo."
  - R. Comerford, "Mecha … what?" *IEEE Spectrum*, 31(8), 46-49, 1994.
- "The word, mechatronics is composed of *mecha* from mechanics and *tronics* from electronics. In other words, technologies and developed products will be incorporating electronics more and more into mechanisms, intimately and organically, and making it impossible to tell where one ends and the other begins."
  - T. Mori, "Mechatronics," *Yasakawa Internal Trademark Application Memo*, 21.131.01, July 12, 1969.



Mechatronics History (Cont.)

Mechatronics Defined — II

- "Integration of electronics, control engineering, and mechanical engineering."
  - W. Bolton, *Mechatronics: Electronic Control Systems in Mechanical Engineering*, Longman, 1995.
- "Application of complex decision making to the operation of physical systems."
  - D. M. Auslander and C. J. Kempf, *Mechatronics: Mechanical System Interfacing*, Prentice-Hall, 1996.
- "Synergistic integration of mechanical engineering with electronics and intelligent computer control in the design and manufacturing of industrial products and processes."
  - F. Harshama, M. Tomizuka, and T. Fukuda, "Mechatronics-what is it, why, and how?-and editorial," *IEEE/ASME Trans. on Mechatronics*, 1(1), 1-4, 1996.

Mechatronics Define

- "Synergistic use of precision engineering, control t sensor and actuator technology to design improved p
  - S. Ashley, "Getting a hold on mechatronics," *Mechan*
- "Methodology used for the optimal design of electro
  - D. Shetty and R. A Kolk, *Mechatronics System Desig*
- "Field of study involving the analysis, design, synth that combine electronics and mechanical componer microprocessors."
  - D. G. Alciatore and M. B. Histand, *Introduction to Systems*, McGraw Hill, 1998.
- Aside: Web site devoted to definitions of mechatron
  - http://www.engr.colostate.edu/~dga/mechatronics/def

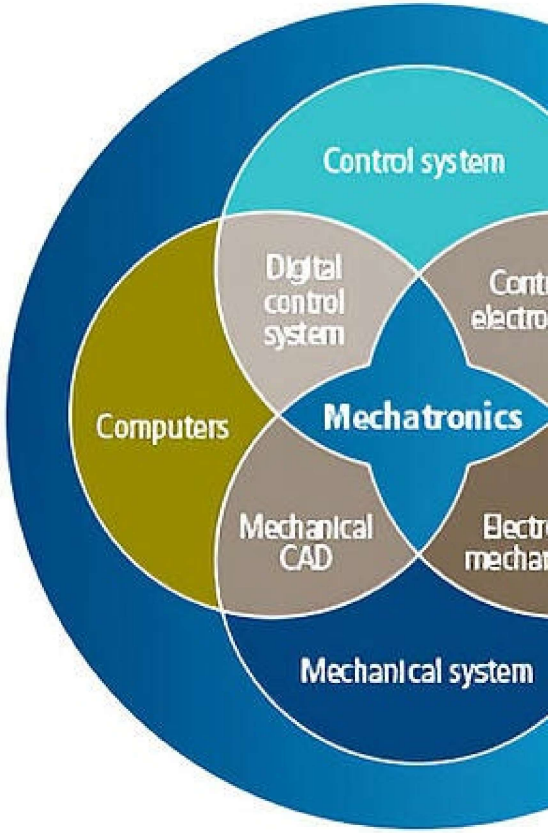
Mechatronics Definition

Mechatronics: Working Definition for us

The synergistic combination of mechanical, electrical, and computer engineering Emphasis on integrated design for products. Optimal combination of appropriate technologies.

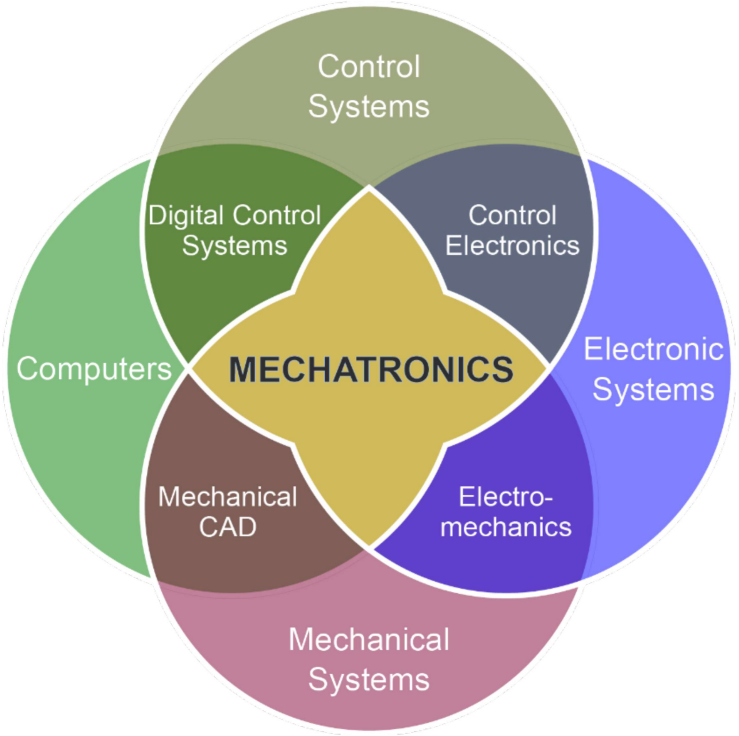
More Specifically,

Mechatronics is the synergistic integration of sensors, actuators, signal conditioning, power electronics, decision and control algorithms, and computer hardware and software to manage complexity, uncertainty, and communication in engineered systems.



Mechatronics Engineering

Mechatronics Engineering is the study of the synergistic integration of precise mechanics, e theory, and computer science within product design and manufacturing, in order to improv functionality.



(3) Bachelor of Engineering Honours (Mechatro of Sydney - YouTube

Difference Between Electro - Mechanical system and Mechatronic

Electro – Mechanical System: In general, An Electro – Mechanical system only consists of electrical cir components. It lacks control systems or computer programming. In other words, this system lacks automatic

Mechatronics System: Whereas A mechatronics system combines electrical and mechanical system with computer programming such that the system can be automatic.

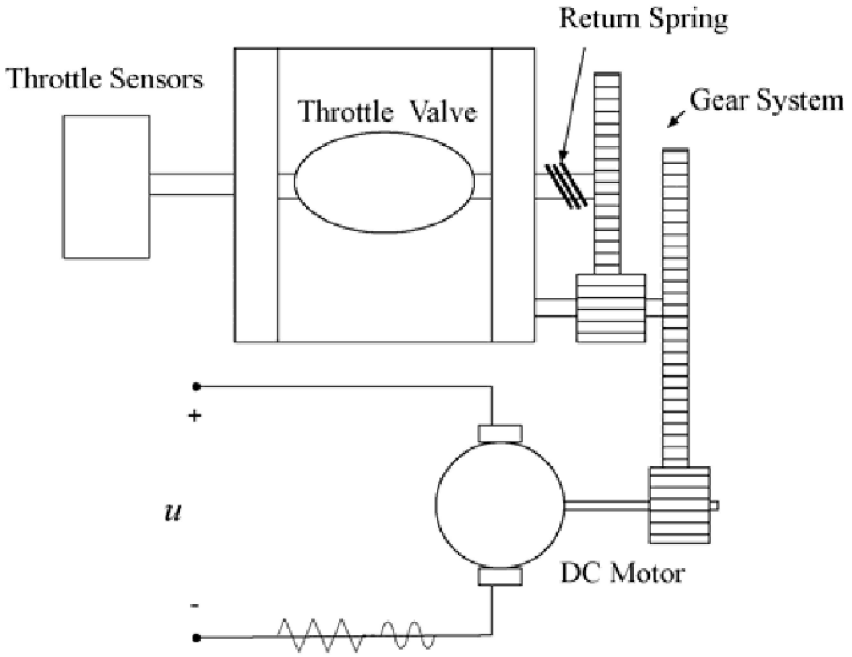


Fig.: Electro – Mechanical system

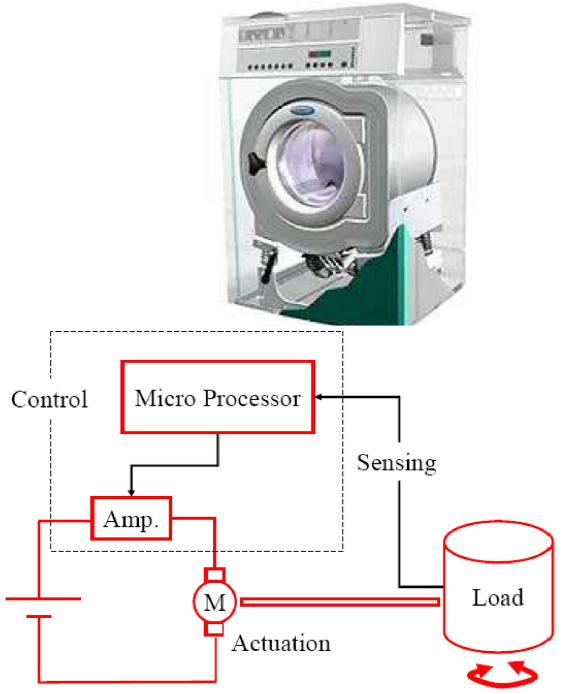


Fig. : Mechatronics system (Automatic Washing

Applications of Mechatronics Engineering

Home:

- Washing Machine
- Automatic camera
- AC

Office:

- Xerox/Copy Machine
- Barcode reader

Industrial:

- Conveyors / Automatic

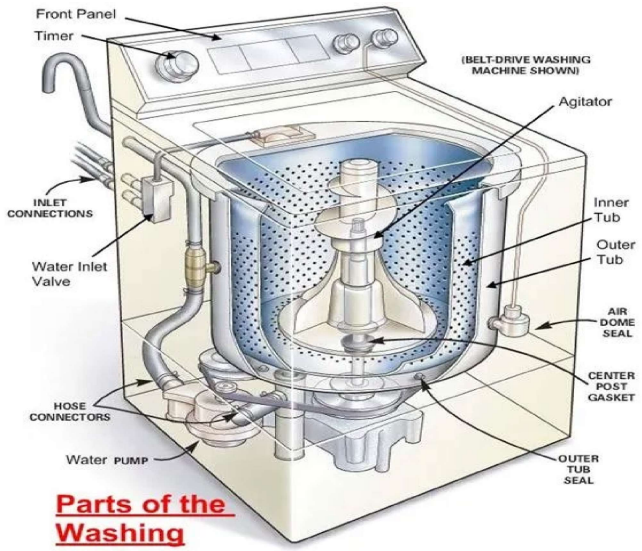


Fig. 1.3: Washing Machine System

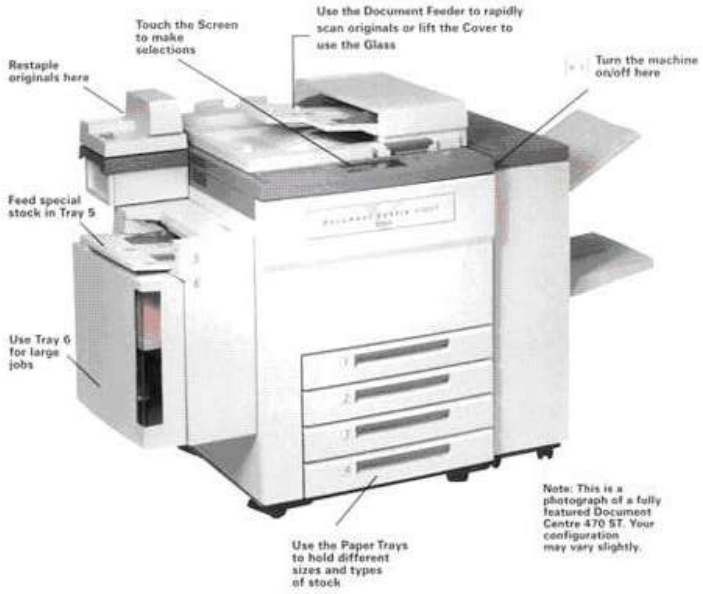


Fig. 1.4: Copy Machine System

Fig. 1.5: Automatic F

Applications of Mechatronics Engineering (Con

Smart Consumer Products:

home security, camera, microwave oven, toaster, dish washer, laundry washer-dryer, climate control units, etc.

Fig. 1.6: CCTV Camera

Medical:

implant-devices, assisted surgery, haptic, etc.

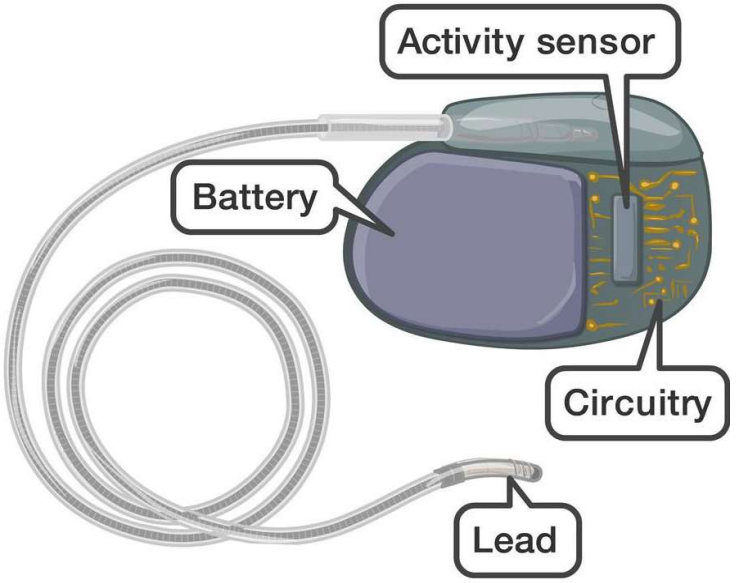


Fig. 1.7: Pacemaker

Defense:

unmanned air, grou vehicles, smart mur etc.

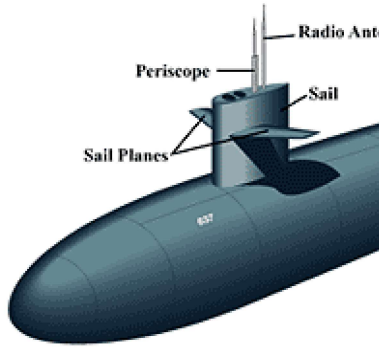


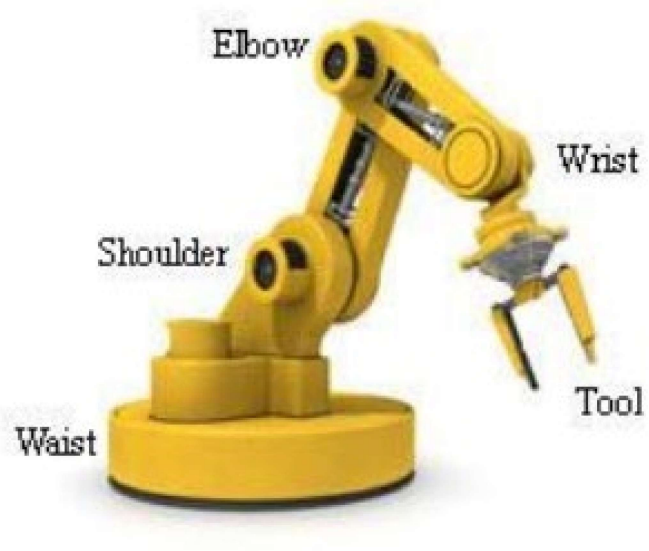
Fig. 1.

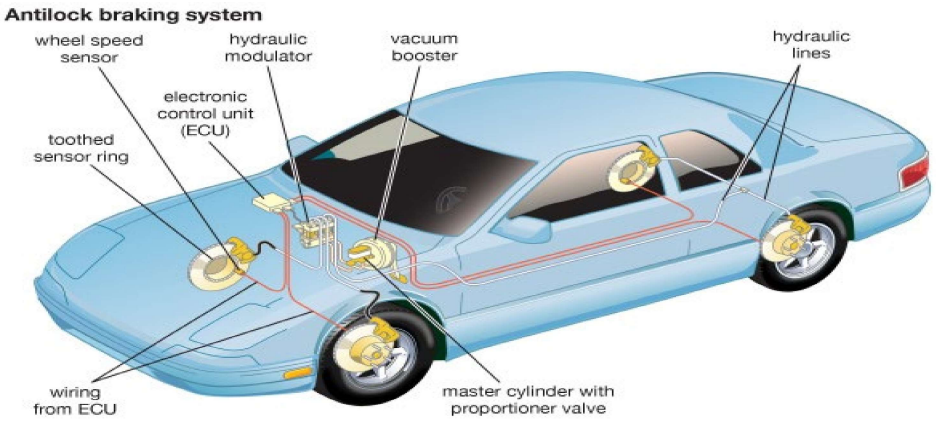
Applications of Mechatronics Engineering (Con

Manufacturing:
robotics, CNC/ PLC machines, etc.

Automotive:
climate control, antilock brake, active suspension, cruise control, air bags, engine management, safety, etc.

Transportation:
Maglev, Segway





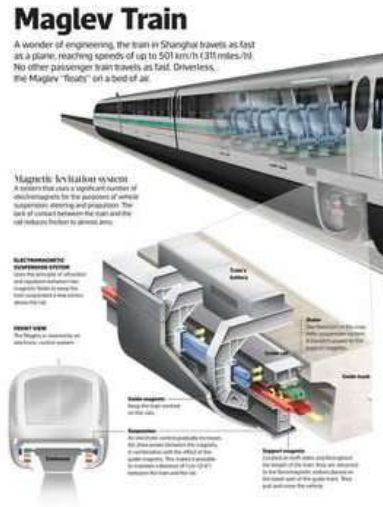


Fig. 1.9: Industrial Robot

Fig. 1.10: ABS System

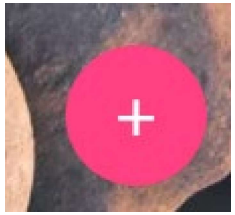
Fig. 1.11

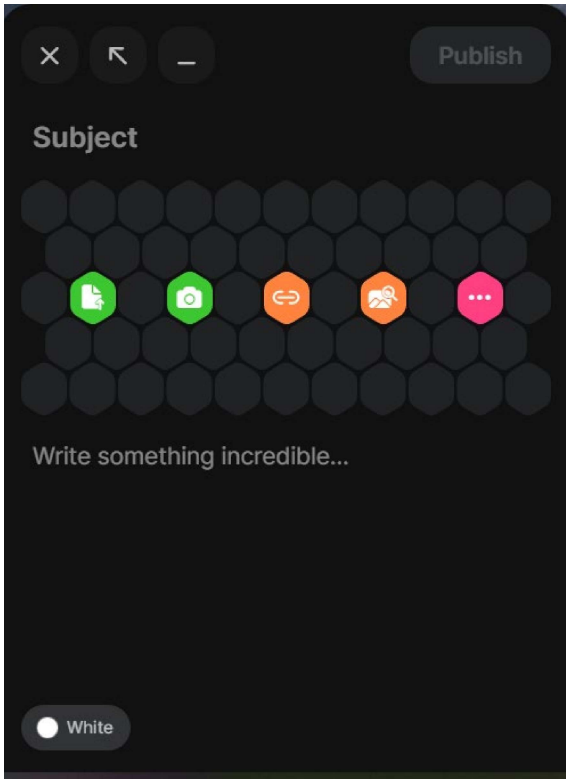
And Many More……

Where There is Anything Smart, That is Mechatronics

Class Work

- Go https://padlet.com/prangonruetmte/ecet98n8fjk3x7cn
- Click the + icon at the bottom right corner of the page.
- Write your **roll no** at the **subject.**
- Give a real-life example of applications of Mechatronics Engineering in various fields.
- Attach a picture/gif.
- Give the **caption** of the picture as the filed.
- In the **description** write the name of the application.
- An example is given for better understanding.





Fields:

- Home Automation.
- Office
- Industry Applications
- Smart Consumer Products
- Sports
- Communication
- Medical
- Defense
- Manufacturing
- Automobile
- Transportation
- Space Exploration

THANK YOU