DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CS MAIL

NEWSLETTER VOLUME 11, ISSUE I, FEB 2023

Dear Readers,

It is with great pleasure that we bring you **Volume 11, Issue I** of our department newsletter **"CS MAIL"**. The current newsletter highlights the activities of the department, achievements of faculty and students during the past six months. It also features workshop organized and attended, paper publication details and other social activity undertaken from CS Department. Your valuable comments and suggestions are appreciated.

We wish all the readers an enjoyable reading.

VISION OF THE DEPARTMENT

- To develop highly talented individuals in Computer Science and Engineering to deal with real world challenges in industry, education, research and society.

MISSION OF THE DEPARTMENT

- To inculcate professional behavior, Strong ethical values, innovative research capabilities and leadership abilities in the young minds & to provide a teaching environment that emphasizes depth, originality and critical thinking.

- Motivate students to put their thoughts and ideas adoptable by industry or to pursue higher studies leading to research.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

- Empower students with a strong basis in the mathematical, scientific and engineering fundamentals to solve computational problems and to prepare them for employment, higher learning and R&D.

- Gain technical knowledge, skills and awareness of current technologies of computer science engineering and to develop an ability to design and provide novel engineering solutions for software/hardware problems through entrepreneurial skills.

- Exposure to emerging technologies and work in teams on interdisciplinary projects with effective communication skills and leadership qualities.

- Ability to function ethically and responsibly in a rapidly changing environment by applying innovative ideas in the latest technology, to become effective professionals in Computer Science to bear a life-long career in related areas.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

- Ability to apply skills in the field of algorithms, database design, web design, cloud computing and data analytics.

- Apply knowledge in the field of computer networks for building network and internet based applications.

Message From Principal

ATMECE has emerged as a prominent institute offering quality education. All round continuous changes in infrastructure and academics standard have helped us to build a brand name. It gives me immense pleasure to introduce the **Volume 11, Issue I OF THE HALF YEARLY NEWSLETTER "CS MAIL"** of Computer Science Department. I am pleased to know that the newsletter will showcase the activities and credentials of CS&E department. I hope this will become a platform for students and staff to exhibit their talents in science and technology. On behalf of management, I appreciate the newsletter committee for their efforts in bringing out this edition.

I wish the editorial all success!!!

Regards
Dr L Basavaraj
Principal, ATMECE

DON'T WAIT FOR OPPORTUNITY CREATE IT

Message From Chief Editor

Dr. Puttegowda D
HoD, CS&E

Department of Computer Science & Engineering commits to work towards developing dedicated professional with a rich blend of competent, technical, managerial and social skills to contribute nation building. I am happy to inform that our department newsletter **"CS MAIL"** is being released in the month of Feb 2023. The newsletter encourage departments technical activities and also motivate students to bring out their innovative ideas , hidden talents and also provide a common platform to share their knowledge, in turn gain technical knowledge.

I wish all the readers an enjoyable reading!!!

TOPPERS

3rd Semester

USN	STUDENT NAME	SGPA
4AD21CS044	M K DECHAMMA	9.33
4AD21CS074	RACHANA N A	9.28
4AD21CS113	VINAY M	9.00

5th Semester

USN	STUDENT NAME	SGPA
4AD20CS034	LAKSHMI C	9.00
4AD20CS101	VARSHA G R	8.76
4AD20CS032	KAVANA K R	8.72

7th Semester

USN	STUDENT NAME	SGPA
4AD19CS003	AMOGH P	9.85
4AD19CS043	MOHAMED RAIHAN	9.55
4AD19CS012	BHAVANI SINGH	9.30

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Prinicpal, ATMECE

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HOD, CS&E

Editor
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Assistant Professor, CS&E

Student Cordinators
PRATEEK B ALAVANDI
KISHORE K

A DREAM BECOMES A GOAL WHEN ACTION IS TAKEN TOWARD ITS ACHIEVEMENT

DEPARTMENT ACTIVITIES

Technical Talk on "Importance of Emerging Technologies in Industry" on 21/11/2022

A seminar was conducted by Department of Computer Science and Engineering, ATMECE, Mysore for 3rd year students regarding "**Importance of Emerging Technologies in Industry**" on 21st November 2022. The Resource person was **Mr. Shashi Kumar Y S, Chief Technology Officer, Pentagon Space, Bangalore, Bangalore**. The Event was convened by **Dr. PutteGowda D, HOD of CSE Dept, ATMECE and coordinated by Mrs. Sushma Varadraju, Assistant Professor, Dept. of CSE, ATMECE.**

Resource person briefed that data is ruling the world, they expected that in 2025 1 zeta bytes of data will be used for computing purpose. (1 zettabyte =1 million tera bytes).

- They gave an introduction about full stack web development, software/system testing, cloud computing and ui/ux design.
- They gave some tips about how to introduce ourselves in front of recruiters called as introduction tips.
- They told about their company called 'pentagon space' and they gave some offers to our college i.e full stack development, python full stack development and system testing and ui/ux design.
- They told the difference between product base company and service base company.
- They briefed that Emerging technologies play a vital role in the modernization of industries. New technologies help in transforming enterprises into a digital world. Technology is indeed one of the fastest-growing agents in the present world than ever before. The emerging technology has brought a significant transfer in information, technology and development sectors mainly.

List of Latest Technologies Discussed by Resource person:

1. **Artificial Intelligence:** AI is an emerging engineering branch and why it can provide you with a job easy and secure. Artificial Intelligence is the future of humans, industries as well as organizations. Artificial intelligence is working as an integral part of many industries. Artificial Intelligence shows a huge prospective to automate business, make intelligent decisions, understand the market need, and effectively utilize available resources. Before understanding the benefits of Artificial intelligence, we need to recognize relevant use cases, design an appropriate solution for analysis, implementing the desired resolution at the organization level, and applying output solutions to various operational activities in the organization. They help us automate each task, like automation of vehicles to e-commerce stores.

2. **Big Data:** As the amount of data is increasing at a rapid pace. So the big data comes into existence and plays a vital role. Big data is a simple and effective method. It is an excellent way to collect, organize and comprehend the data for the benefit of businesses. Big data technology involves building massive data architectures to manage and analyzeunstructured data and offer real-time value for the company.

3. **Machine Learning:** It is a part of AI that enables self-learning from data and then applies that learning without human intervention. Machine Learning is used in many real-life scenarios such as online fraud detection, traffic prediction, automatic language translation, Email spam filtering and many more.

4. **IoT:** IoT is seen as the change agent for the deluxe and practical lifestyle for the consumers, offering precious customer interactions and outstanding experiences. IoT is one of the most exciting areas of focus today. The idea turns around the nano-sensors circulating in the human body or any specific object. Once connected with the technology, this will have a proliferating impact on the various sectors such as medicine, agriculture, architecture etc.

Finally, the seminar was concluded by providing guidance for the students to make use of the opportunities provided by the college to improve their skills.

A 2 days workshop on **"Full Stack Development"** was organized for the 7th Semester Students of Computer Science & Engineering on 16/12/2022 and 17/12/2022.

The main Aim of the workshop is to enhance the programming skills of the students and to create awareness on industry standards. The workshop was inaugurated by **Dr. Basavaraj L,** Principal, ATME College of Engineering, Mysuru. **Dr. Puttegowda D,** Professor & Head Department of Computer Science & Engineering, ATME College of Engineering, Mysuru, and the resource person for the event **Mr. Nikhil Rai,** Software Developer, Coders Arcade, Bengaluru presided over the function.

In his inaugural address, **Dr. Basavaraj L**, sir spoke about the importance of learning and understanding the industry standards. Sir also insisted the students to go make use of the opportunities provided by the department and convert it into a fruitful result.

Later the session was handled by the resource person for the event Mr. Nikhil Rai. He gave introduction to the platform and requirements of Full Stack Developers in the Industry. cross-functional team structure and collaborative approach ensures that all reviews and client feedback are incorporated in the development process were discussed. He also explained the role of a full stack web developer. He has covered different topics like how to make a prototype rapidly, easily switch between front and back end development based on requirements and better understanding about new and upcoming technologies. Hands–on experience was provided to students. The session was very interesting with the participants responding with admissible questions and observations. The participants gave them feedback on the workshop. And finally the sessions of the workshop was concluded by facilitating the resource person.

Workshop on "Interfacing Front End & Back End Connection"

Department of CSE organized two-day workshop on "Interfacing Front End & Back End Connection" for 5th sem students. The main motto of the workshop was to teach students how to "INTERFACE FRONT-END AND BACK-END CONNECTIONS'', Mr. ANIL KUMAR B H a framework designer, servicing in SISC, Bangalore was invited as a resource person. Event got started from 9:00 AM end ended at 5:00 PM, Coordinated by Mrs. Kavyashree E D & Mrs. Sushma V, Asst. Prof. Dept. of CSE.

Objective:

Students will be learning front end technologies such as Java, Python & Php.

Day 1:13th Jan 2023

The session was divide into two parts morning and afternoon session. In the morning session Resource Person gave a brief introduction on the front end and back end tools used for website creation. Students were taught the format of HTML and PHP languages such as how to write the syntax and run them on browser. He gave brief overview on how to connect front end with back end by using xampp server and also demonstrated how to create login page and sign up page with some examples to convey the topics clearly. Students were even introduced to many software tools like XAMPP, WAMPP, apache (java), notepad++, and many more.

Dr Puttegowda D, Professor & HoD, Dept. of CSE addressing the students.

After the lunch break afternoon session was about how to create a database, table using GUI tool i.e xampp server and also how to update, insert, delete the data in the database. After this resource person discussed about the concepts triggers and stored procedures and also demonstrated it using GUI tool. After attending this session, students have a clear idea about front end and back end tools which help them in developing DBMS mini project.

Day2: 21st Jan 2023

Addressing students doubts with respect to mini project development.

Outcome:
- Students can build projects on web applications.
- Students can interface front end and back-end connection

PO Addressed	PSO Addressed
PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11	**PSO2**

FACULTY PARTICIPATION

CONFERENCES / JOURNALS

Sl. No.	Authors Name (As in the journal)	Title of the Paper	Journal Name	Volume No / Issue No/ Pg. No	Date of Publication
1	Dayananda K J, Puttegowda D	Color K-means, Gaussian Filter and Aperture Concept for Text Localization in Images	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
2	Lavanya N, Preethi R, Thejaswini U, Nesara and Prerana	Wheat Variety Identification using Deep Lea Lavanya N, Preethi R, Thejaswini U, Nesara and Prerana	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
3	Anil Kumar C J, Christo Abraham, Darshan M C, Freddy Dominic, Anandakrishnan P S	Robust Human Activity Recognition Using Multimodal Feature-Level Fusion	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
4	Sushma V, Shriya Neelamma, Yathin machaiah and Suroor Fathima	Credit Card Fraud Detection using Machine Learning	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
5	Sushma V, Bhumika K, Chaithra M, and Kavyashree T H	Plant Health Monitoring using IoT	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
6	Chethana C and Deepu R	Virtual Aerial View Projection of Vehicular Surrounding	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
7	Raghuram A S, Bhoomika B R, Gokul D, Malavika Kuppand and Mohammed khaleeq	A Review on Detection of Offensive Language in Social Media	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23

8	Nasreen Fathima, Yashwanth V E, Aishwarya C, Pranjali and Taanya K M	Traffic Clearance for Ambulance using Deep Learning	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
9	Deepu R, Kishore P, Bibi Javeriya, Kiran Hadapad and Anushka D K	Paddy Leaf Disease Detection using Machine Learning	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
10	Puttegowda D, Harsha A B, Bhaskar H N, Deepika D and Monika B V	Deep Learning Based Container for Text Recognition	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
11	Anil Kumar C J, Mohamed Shamaz, Mohammed Bilal and Mohammed Habeeb Ulla	Face Recognition at Varying Angles	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
12	Kavya P O, Rashmi T S, Sonu R S, Sapna R and Sayada Aasreen Kouser	Brain Tumor Detection using Image Segmentation	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
13	Pavithra K, Gorabal J V, Pavithra N, Priya B R and Ramyashree N	Offline Signature Validation using Image Processing	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
14	Kiran B, Nischitha M Dev, Sampath Kumar B, Shashank K and Suraj S	Parking Space Detector	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23
15	Raghuram A S, Aishwarya R K, Anup G Kulkarni, Asher Calvyn A, Jathin C S	A Review on Food Waste Management and Donation App	Grenze International Journal of Engineering and Technology	Volume 9, Issue 1	Jan-23

TECHNICAL ARTICLES

The Evolution of Robotics Research

This article surveys the evolution of robotics research in the last half century as a response to the evolution of human social needs, from the industrial robotics that released the human operator from dangerous or risky tasks to the recent explosion of field and service robotics to assist the human. This article surveys traditional research topics in industrial robotics and mobile robotics and then expands on new trends in robotics research that focus more on the interaction between human and robot. The new trends in robotics research have been denominated service robotics because of their general goal of getting robots closer to human social needs, and this article surveys research on service robotics such as medical robotics, rehabilitation robotics, underwater robotics, field robotics, construction robotics and humanoid robotics. The aim of this article is to provide an overview of the evolution of research topics in robotics from classical motion control for industrial robots to modern intelligent control techniques and social learning paradigms, among other aspects.

Introduction

During the last 45 years, robotics research has been aimed at finding solutions to the technical necessities of applied robotics. The evolution of application fields and their sophistication have influenced research topics in the robotics community. This evolution has been dominated by human necessities. In the early 1960s, the industrial revolution put industrial robots in the factory to release the human operator from risky and harmful tasks. The later incorporation of industrial robots into other types of production processes added new requirements that called for more flexibility and intelligence in industrial robots. Currently, the creation of new needs and markets outside the traditional manufacturing robotic market (i.e., cleaning, demining, construction, shipbuilding, agriculture) and the aging world we live in is demanding field and service robots to attend to the new market and to human social needs.

Industrial Robots

It was around 1960 when industrial robots were first introduced in the production process, and until the 1990s industrial robots dominated robotics research. In the beginning, the automotive industry dictated the specifications industrial robots had to meet, mainly due to the industry's market clout and clear technical necessities. These necessities determined which areas of investigation were predominant during that period.
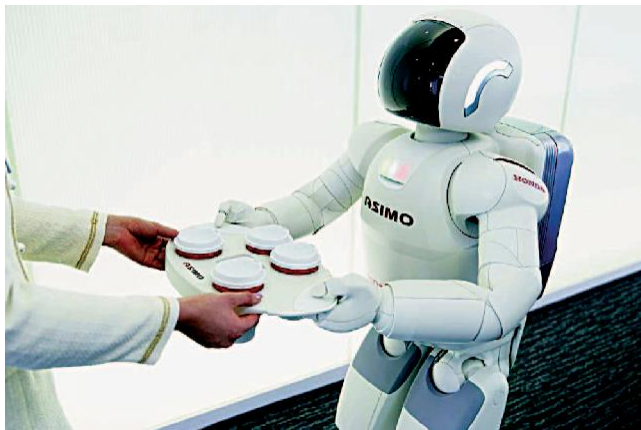
One such area was kinematic calibration, which is a necessary process due to the inaccuracy of kinematic models based on manufacturing parameters. The calibration process is carried out in four stages. The first stage is mathematical modeling, where the Denavit-Hartenberg (DH) method and the product-of-exponential (POE) formulation lead the large family of methods. A detailed discussion of the fundamentals of kinematic modeling can be found in the literature. The gap between the theoretical model and the real model is found in the second stage by direct measurement through sensors. Thus, the true position of the robot's end effector is determined, and by means of optimization techniques, the parameters that vary from their nominal values are identified in the third stage. Last, implementation in the robot is the process of incorporating the improved kinematic model. This process will depend on the complexity of the machine, and iterative methods will have to be employed in the most complex cases. Research in robot calibration remains an open issue, and new methods that reduce the computational complexity of the calibration process are still being proposed.

These methods consist mainly of two classes of algorithms, the family of road-map methods that include the visibility graph, the Voronoi diagram, the free-way method and the Roadmap algorithm, and the cell-decomposition methods. Continuous explicit methods, on the other hand, consist in basically open-loop control laws. One important family of methods is based on optimal-control strategies, whose main disadvantages are their computational cost and dependence on the accuracy of the robot's dynamic model.

Besides planning robot motion, control laws that assure the execution of the plan are required in order to accomplish the robot's task. Thus, one fundamental research topic focuses on control techniques. A robot manipulator is a nonlinear, multi-variable system

and a wide spectrum of control techniques can be experimented here, ranging from the simpler proportional derivative (PD) and proportional integral derivative (PID) control to the computed-torque method, and the more sophisticated adaptive control whose details are out of the scope of this survey.

Typical industrial robots are designed to manipulate objects and interact with their environment, mainly during tasks such as polishing, milling, assembling, etc. In the control of the interaction between manipulator and environment, the contact force at the manipulator's end effector is regulated. There are diverse schemes of active force control, such as stiffness control, compliant control, impedance control, explicit force control and hybrid force/position control. The first three schemes belong to the category of indirect force control, which achieves force control via motion control, while the last two methods perform direct force control by means of explicit closure of the force-feedback loop.

Medical Robots

In recent years, the field of medicine has been also invaded by robots, not to replace qualified personnel such as doctors and nurses, but to assist them in routine work and precision tasks. Medical robotics is a promising field that really took off in the 1990s. Since then, a wide variety of medical applications have emerged: laboratory robots, telesurgery, surgical training, remote surgery, telemedicine and teleconsultation, rehabilitation, help for the deaf and the blind, and hospital robots. Medical robots assist in operations on heart-attack victims and make possible the millimeter-fine adjustment of prostheses. There are, however, many challenges in the widespread implementation of robotics in the medical field, mainly due to issues such as safety, precision, cost and reluctance to accept this technology.

Rehabilitation Robots

Activity in the field of rehabilitation robotics began in the 1960s and has slowly evolved through the years to a point where the first commercially successful products are now available. Today, the concept of "rehabilitation robot" may include a wide array of mechatronic devices ranging from artificial limbs to robots for supporting rehabilitation therapy or for providing personal assistance in hospital and residential sites. Examples include robots for neuro-rehabilitation, power-augmentation orthosis, rehabilitative orthosis, etc. The field of rehabilitation robotics is less developed than that of industrial robotics. Many assistive robotic systems have featured an industrial robot arm for reasons of economy and availability. However, the specifications for robots in these two application areas are very different. The differences arise from the involvement of the user in rehabilitation applications. Industrial robots are typically powerful and rigid to provide speed and accuracy. They operate autonomously and, for reasons of safety, no human interaction is permitted. Rehabilitation robots must operate more slowly and be more compliant to facilitate safe user interaction.

Robot Localization

The localization process allows a mobile robot to know where it is at any moment relative to its environment. For this purpose sensors are used that enable measurements to be taken related to the robot's state and its environment. These sensors accumulate errors and provide noisy measurements. For that reason, a great deal of research centers on improving position estimation by means of integrating measurements taken by several sensor types using Kalman filter techniques. Localization can be local or global. The simplest solution is local localization, where the robot incrementally corrects its position relative to an initial location, whereas in global localization the robot's initial position is not needed. In addition, the location process can be based on the sensorial identification of land- marks in the environment whose location is well known, or it can be based on maps or models of the environment and identify characteristic elements of the mapped environment. In this latter case, probabilistic approaches are used to solve the problem of uncertainty in the sensorial information.
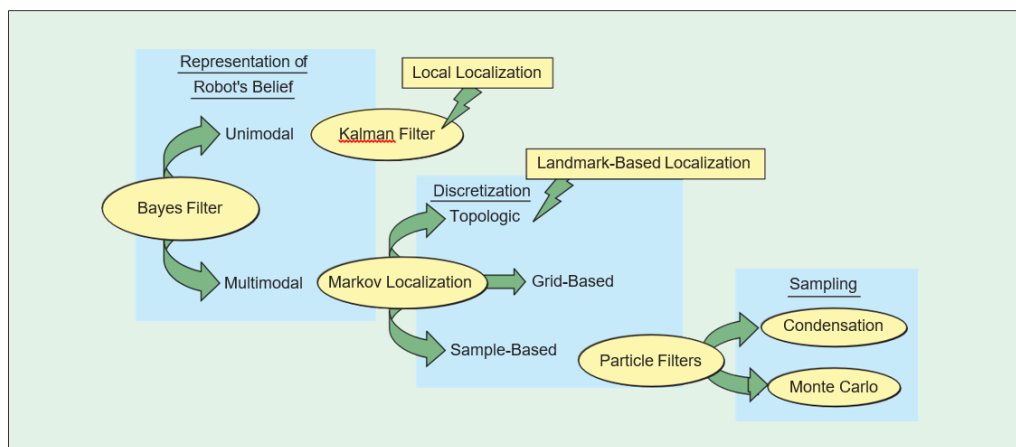

Figure: A classification of localization algorithms.

Robotic Mapping

Because map-based robot localization and robotic mapping are interdependent, research since 1990 has focused on solving both problems simultaneously. However, before then, the field of mapping was divided into metric and topological approaches. Metric maps capture the geometric proper- ties of the environment, while topological maps describe the connectivity of different places by means of nodes-and-arcs graphs. In practice, metric maps are finer grained than topological maps, but higher resolution comes at a computational burden. Metric maps can be discretized based on the probability of space occupation. The resulting mapping approaches are known as occupancy-grid mapping. In contrast, the metric maps of geometric elements retain positions and properties of objects with specific geometric features.

Underwater Robots

More than 70% of the earth is covered by ocean. However, little effort has been made to utilize or protect this vast resource, compared to space or terrestrial programs. During the last few years, the use of underwater robotic vehicles has rapidly increased, since such vehicles can be operated in the deeper, riskier areas that divers cannot reach. The potential applications of such vehicles include fishing, under- water pollution monitoring, rescue, and waste cleaning and handling in the ocean as well as at nuclear sites. Most commercial unmanned underwater robots are tethered and remotely operated; they are as a group, referred to as remotely operated vehicles (ROVs). However, extensive use of manned submersibles and ROVs is currently limited to a few applications because of very high operational costs, operator fatigue and safety issues.

Biologically Inspired Robots

Apart from traditional mobile vehicles that use wheels and tracks as locomotion systems, there is widespread activity in introducing inspiration from biology to produce novel types of robots with adaptive locomotion systems. Probably the most widely used biologically inspired locomotion system is the leg. However, there are some research groups focusing on other types of locomotion, such as the systems used by snakes and fishes. Our survey here will focus on walking robots and humanoid robots because of their more extended use. Both walking robots and humanoids use legs as their locomotion systems; however they differ in their research topics and service applications. Moreover, research on humanoid robotics does not only involve all aspects related to locomotion, but includes research on other "human" aspects as well, such as communication, emotion expression and so on. For this reason, we survey them separately.

Walking Robots

There has been great effort in studying mobile robots that use legs as their locomotion system. Some developments are shown in Figure next. The legs of walking robots are based on two- or three-degrees-of-freedom (DOF) manipulators, and therefore walking robots share some of the technical problems typical of both industrial robots and mobile robots.
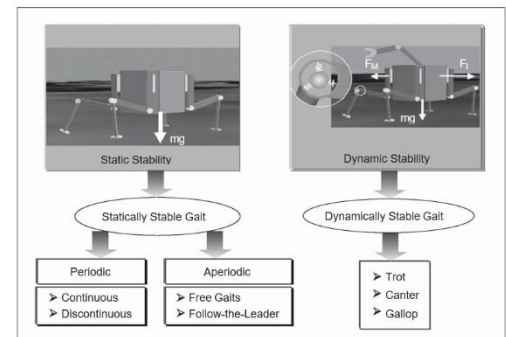

Figure: Types of stability criteria and gaits for walking robots

Humanoid Robots

When talking about dynamically stable walking robots, humanoid robots come to mind. Actual autonomous biped robots did not appear until 1967, when Vukobratovic et al. lead the first experiments with dermato-skeletons. The first controller-based biped robot was developed at Waseda University, Tokyo, Japan, in 1972. The robot was called WL-5.

Friendly human-robot interfaces that make it easier for non-skilled users to operate a robot. Speech- recognition systems, electromyogram , and electrooculogram signal interpretation are some of the approaches being considered. Safe human-robot interaction. The problem is being overcome by considering both safe actuation control designs that reduce the impact loads associated with uncontrolled motion and safe robot-motion planning. Emotion expression and perception. The exciting research in this direction is envisaged for application such as personal and social robots.

By
Department of CS&E Faculties

THINK PEACE AND LIVE GREEN…

"MAKE EVERY DROP OF WATER COUNT"

Dear Readers,

Your advice or suggestions will be much appreciated and are most welcome!!!
Please mail your articles to **csdept@atme.in**

Be willing to be a beginner every single morning