

Our Team of Researchers

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ORIGINAL CONCEPT



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University of Management and Technology

The University of Management and Technology (UMT) is a distinguished name among the reputed universities of Pakistan. The University, since its inception is aiming to deliver quality education to its undergraduate and graduate students in various disciplines. The university has integrated its research groups under the Center for Advancement of Systems and Technology (CAST). With the introduction of CAST, the university aims to further invigorate its research endeavors.





University of Management
and Technology





CAST: Center for Advancement in Systems and Technology

CAST primarily aims to develop a continual link between the university and industry. It will significantly contribute towards the enhancement of the ICT related human resource development and will ensure an unconditional prosperity of society. Moreover, CAST aims to transform nation's economy into knowledge based economy by promoting resourceful, sustainable and efficient ICT ideas through synergic development of industrial and academic resources.

Research Areas

Telecommunications



Education



Industrial and Energy Sector Development



Agriculture



Healthcare



Public Services, Safety and Security





Telecommunication

Due to the increasing demands for broadband data communications, Free Space Optical (FSO) links are gaining more attention for their high-bandwidth and inherent security over long distances. However, their performance is degraded due to atmospheric turbulence, plus meteorological conditions such as dust, clouds and fog. The group aims at developing FSO links and advance communication systems to achieve maximum link availability and provide heterogeneous wireless services.

Many communication devices are now designed using SDR (Software Defined Radios). The group focuses on designing the satellite Transceiver using SDR, Security Surveillance System, Electricity Theft Prevention System, Media Center, Robotics, SDR-RADAR, Sim Free Wireless Communication Networks for disaster management, etc.

Team Members

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Areas of Interest: Satellite Communication

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Education

Human beings are following the process of continuous socialization. They need to have an unending system for acquiring various branches of modern education. These branches should provide an easy access and easy understanding. Our education research group aims to promote knowledge by using state of the art technologies. The use of these technologies draws considerable impact on education delivery methods and eventually transforms learning into customizable products.

The group focuses on the promotion of knowledge with the ways in which state-of-the-art technologies are used to enhance education by producing quality research through publications which extend pedagogical, cognitive theories and practices. The group aims to make impact on education methods and practices in order to transform learning based recent Information and Communication Technologies (ICT).

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Public Services, Safety and Security

Individuals, governments and organizations now routinely connect their computers to the Internet to communicate, provide services, and access massive stores of shared information. These on-line activities, many of which are conducted beyond national boundaries, have opened up enormous opportunities for security attacks such as identity thefts, computer hackings, privacy breaches, technical sabotages, etc. Addressing the security threats and attacks in this vast and complex distributed environment is an immensely challenging task, and is the prime focus of this group.

The world has become a global village and Cross Lingual Information Retrieval (CLIR) has become an established area of research. In CLIR, usually the query words are translated into the corresponding words in the language of data source to be searched; however, there are certain words that do not have a matching corresponding word. The names are an example of such words. In this project, we aim to develop techniques, that can match the name spelled in English with the same occurrences of the same name in data sources of regional languages of Pakistan. We have already built a small dataset of 300 Pakistani Names. Moreover, one MS-thesis has been produced under this project.

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Agriculture

Every accumulation of data in its raw form holds obscure patterns. Pattern recognition deals with the science of transforming and classifying entities on the basis of these patterns. It is a vast field as it deals with data from diverse sources. Researchers have worked on various stochastic, probabilistic and neuro-cognitive techniques for classifying patterns. The ultimate objective is to make machines ideally as intelligent as humans in recognizing these patterns, which help to form automated systems for conduction of routine matters. The research group aims at developing systems in which data is used for various purposes like agriculture research, crop recommendation, soil analysis, surveillance, event detection, emotion and action recognition. Moreover, the genetic and protein structure in living organism form intrinsic patterns. Furthermore, the group focuses on incorporating use of computational intelligence in protein sequencing, gene expression, comparative genomics, mutation, disease genetics and molecular interaction networks.

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CAST will help study and examine challenges faced by the health care system in realizing the emerging vision of patient-centered, evidence-based and efficient health care systems. Automation is about the systems for repetitive tasks in the administration of medicine, lab results and invoice generation and developing a decision. The CAST will support to reduce response time under emergent conditions and will improve the accuracy of recommendations. It will evolve knowledge discovery and mining from the collected data for detailed analysis to form future care strategies. This would yield significantly increased medical effectiveness and reduced cost. CAST will also focus on practices and policies which will address the weak areas of current health care system with a promise of offering quality care treatment to the patients in the light of modern day technology related to medicine and to support physicians as they treat patients.

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Resilient industry is the backbone of any economy and smart energy sector is a lifeline for a nation's industry. This group aims to provide market-ready frameworks to tackle the industry's hard-hitting challenges including industrial automation and control. In addition, the group strives to design and develop cost effective and sustainable energy production and distribution systems. Major areas under energy research include planning, analysis, modeling, prediction and management of energy. The outcomes of the research are very applied in nature having a direct positive impact on industry academia linkages.

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