



SPCAI

Sino-Pak Center for
Artificial Intelligence



Newsletter



MESSAGE OF RECTOR PAF-IAST



Research and innovation are the two foundation pillars of Pak-Austria Fachhochschule Institute of Applied Sciences and Technology (PAF-IAST). The institute is committed to incorporate path breaking ideas and cutting-edge technology trends into academics and scholastic work for the benefit of students, faculty members and other associated academicians across the globe. In our efforts to achieve excellence in research and innovation, I am delighted to share that the Institute has recently established the Sino-Pak Center for Artificial Intelligence (SPCAI) that is not only aligned but also complement the core national strategies for IT. The major objective is the human resource development to produce required skilled workforce for meeting the challenges in the era of AI. Moreover, the Center along with the Associate Technology Park in its vicinity, will provide technologically modern infrastructure that is critical for furthering the IT industry in Pakistan. It is also an important to foster new human resources capable of developing AI and advanced knowledge of data analysis and translating it into practical applications. In this regard, we plan to develop activities that contribute to improving the research skills of professionals of companies and of other members of society. Some of the identified areas of focus for SPCA, such as Smart Cities, Smart Agriculture and Intelligent Field Robotics along with engagement of internet of things would

help the country in coming up with products and tools which are in reach. Our strong conviction is to facilitate and motivate researchers and academicians to create and nurture applied projects with large societal impact and to develop services to benefit communities at large. A dedicated team of expert faculty members, honorary professors, collaborating international universities and industry partners is available to guide the work. I invite and encourage all the academicians and researchers in the fraternity across the globe to connect with us with a common vision to attain knowledge together and help the world be a better place with use of technology and science. Finally, I would also like to take this opportunity to extend my appreciation and warm wishes to all the associated members for their untiring efforts in this endeavour. Thank you!

Prof. Dr. Mohammad Mujahid
Rector PAF-IAST

MESSAGE OF MANAGING DIRECTOR



We are living in the age of artificial intelligence (AI). Today, the use of AI is rising in every walk of life such as in our means of transportation, our consumer electronics, and our healthcare products. Sino-Pak Center for Artificial Intelligence (SPCAI), a state-of-the-art industrial research facility, is Pakistan's answer to the rising challenge of AI.

SPCAI is a unique project in many aspects. It's based on a trilateral partnership between Pakistan, China, and Austria. Apart from its competent faculty, SPCA drives its main strength from academic and industrial liaisons with top-notch Chinese (e.g., Shenzhen Institute of Advanced Technology and Guangdong University of Technology) and Austrian (e.g., Johannes Kepler University Linz and Software Competence Center Hagenberg) varsities, and research and technological organizations. All these institutes are world-renowned in the field of AI. Another distinctive feature of SPCA is its proximity with industrial hubs such as Hattar industrial estate. This proximity will enable industries to be the part of the value chain, thus directly benefiting from the innovative solutions developed at SPCA.

SPCAI consist of 10 research labs (Intelligent Biomedical Application Lab, Smart City Urban Planning Lab, Smart Agriculture Lab, Applied

Neural Interface Lab, Deep Learning Lab, Intelligent Field Robotics Lab, Computer Vision Lab, Internet of Things Lab, Intelligent System Design Lab and Intelligent Natural Disaster Management Application Lab). Each of these research areas/labs is carefully designed to cater for the socioeconomic needs of the society.

Although improving the competence of local industry through AI-based solutions is one of the primary objectives of SPCA, it has an equal footing on innovative research and national capacity building. This is to compete at the global level to increase the share of Pakistan in the AI market, which is likely to reach approximately US \$ 190.61 billion by 2025. The idea is to establish SPCA as a center of excellence with an international reputé, capable of conducting both fundamental and application-oriented research in AI, providing for indigenous solutions to local challenges, and aligning Pakistan among top AI exporting countries.

The future starts now !

Dr. Atif Mashkoor
MD (Acting) SPCA

OUR VISION

SPCAI is an aspiring research facility actively promoting innovative AI-based solutions for complex day-to-day real-life problems. Our competence in application-oriented research and development lends our industrial partners a decisive competitive edge. Our organizational philosophy is to work with individual responsibility towards common sustainable development goals.



Strengthening the region as a research site

We are continuously expanding our methodological competence and enhancing our application knowledge in socially relevant key issues. In our strategic research, we systematically study specific thematic areas according to international scientific standards and thereby create the theoretical and methodological foundation for subsequent application-oriented projects. As an initiative of PAF-IAST, we contribute significantly to national and international networking with universities, research organizations, and industry. With our

OUR MISSION

Application-oriented industrial research

Our competent and internationally trained staff supports our partners both proactively, i.e., development of innovative ideas, and reactively, i.e., further refinement of existing ideas. This engagement not only enables the seamless transfer of scientific knowledge to industry but also fosters the dissemination of latest technologies via high-quality solutions. For our partners, this widens their horizon, opens future avenues, and cement their market positions.

associated technology park, we make a significant contribution to the development of the region.

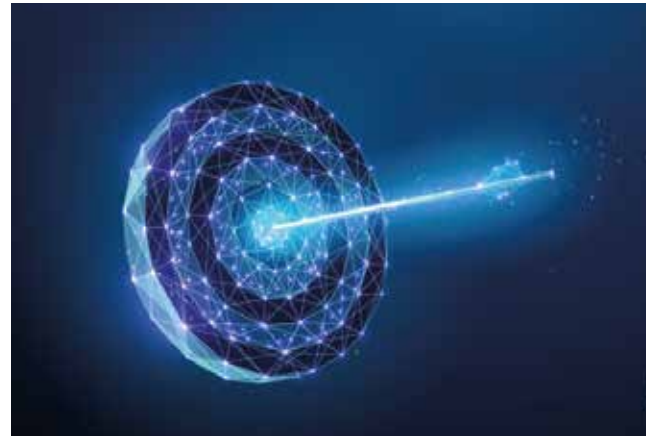
Skilling people

Further pushing the overall aim of PAF-IAST, i.e., "Skilling Pakistan", SPCA I provides a first-class environment for the training of its staff in enhancing their problem-solving skills. We work on enhancement of their cognitive abilities, enabling them to think critically, and solve problems innovatively.

OUR GOALS

The long-term aim of SPCA I is AI-based application-oriented research and development, whereby we combine high-risk strategic research with innovative industrial solutions. Our research agenda encompasses analysis of socio-economic issues using cutting-edge AI methods and design of innovative solutions using technologies including but not limited to

- computer science and mathematics with an emphasis on structures, static and dynamic dependencies, and semantics,
- data analysis using machine learning with a combination of statistical and logical methods, and
- model-driven engineering paradigm with a focus on integration of data, processes, interfaces, service-orientation, refinement, and quality assurance.

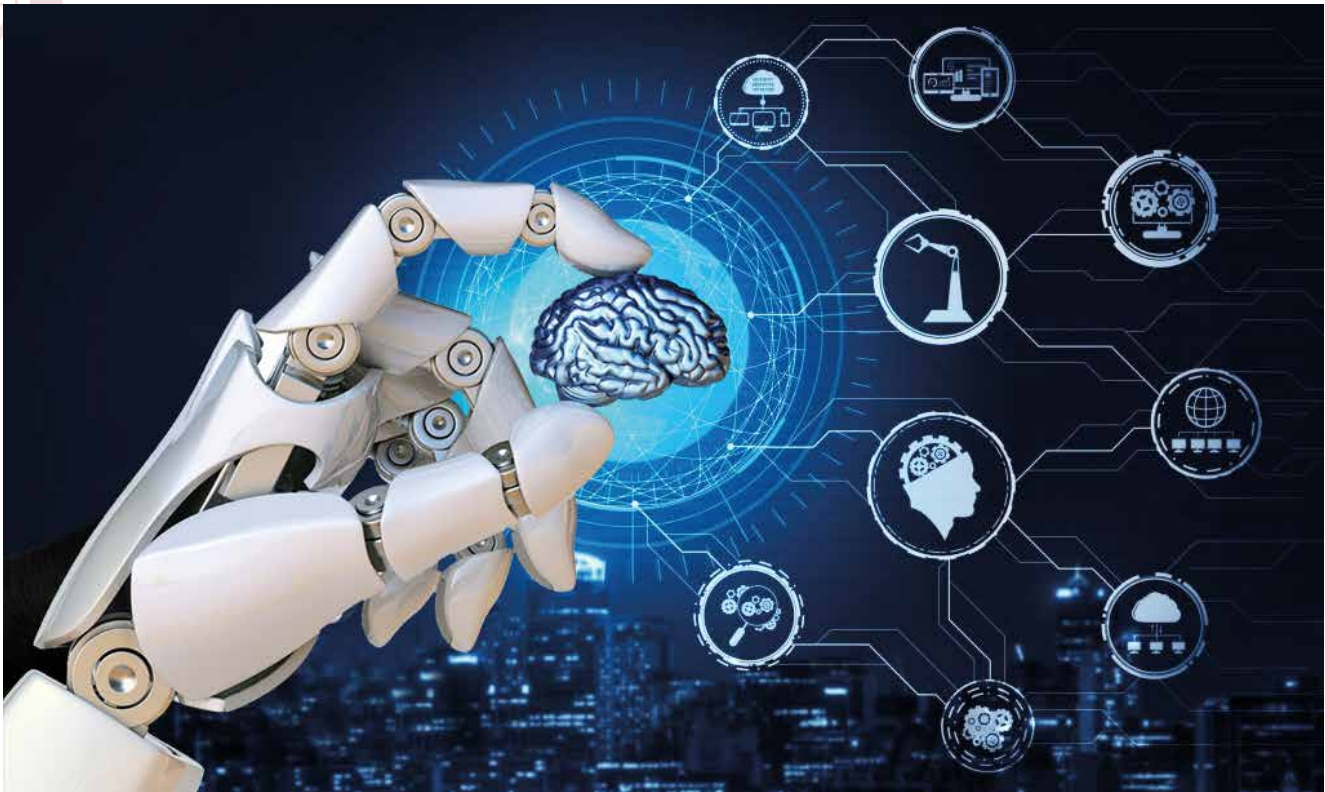


With this research agenda, we strive to be the driving force in the region, at the national level, and also in the international scientific community. We transfer research results to industrial applications in cooperation with our partners, which are the key element of our innovation chain.



OUR VALUES

SPCA I is an independent and not-for-profit research facility. We utilize the funding entrusted to us responsibly, effectively, and economically. We value critical thinking, creativity, motivation, and teamwork. We continuously strive for the betterment of society by playing our role. We create a good working environment through openness, trust, respect, tolerance, reliability, and fairness. We are an equal opportunity provider, and we believe in women empowerment.



SINO-PAK CENTER FOR ARTIFICIAL INTELLIGENCE IN A NUTSHELL

PAF-IAST had got approval for establishing the SPCAI from Public Sector Development funds. The core objective of the center is to build national capacity, to carry out R&D in the emerging field of AI by producing expertise through MS/PhD programs in collaboration with Chinese and Austrian universities, to solve local problems using AI and market them through the technology park, to provide high-value shared services to industrial partners, develop an advanced workforce in AI and Data Science through training and applied work, help in creating ecosystem for startups and spin-off companies to make the region an IT hub for software companies/businesses and to lead other Pakistani universities, institutes, and industries into the era of artificial intelligence by managing and sharing the infrastructure and trained human resource.

The PC1 of SPCAI was approved from Ministry of Information Technology and Telecommunication with a total funding of 991.412 Million PKR. The center aims to facilitate the researchers in nurturing the AI industry following international trends, seeking, and facilitating solutions to the indigenous problems through AI. The government of Pakistan has evolved an effective National IT Policy & Action Plan that clearly caters to the needs of nurturing the industry and is responsive to the dynamic forces of change that can affect its future growth. Core IT policy strategies have been proposed under several focus areas.

The SPCA is fully aligned and compliant with the core national IT strategies in following ways:

i. Human resource development: The objective of SPCA is to develop a large pool of academically as well as technically skilled manpower in AI to meet the local and export needs.



ii. Infrastructure development: Establishment of SPCA labs infrastructure that shall act as incubators in the country leading to start-ups.

iii. Software industry development: SPCA as a platform for the development of intelligent software that support the industrialization, creation of jobs and export-oriented products and services.



iv. Hardware industry development: SPCA as a platform to foster the development of embedded solutions to meet the technology requirements of the country and to have a competitive advantage for the country by delivering innovative solutions.

SPCAI is positioning itself to produce the required skilled workforce for meeting the challenges in the era of AI through human resource development.

ACQUISITION OF GRAPHICAL PROCESSING UNITS (GPU) ACCELERATED HIGH-PERFORMANCE COMPUTING (HPC) CLUSTER FROM LENOVO

Contract for acquiring High-Performance Computing (HPC) was awarded to M/S Commtel for the supply, installation and commissioning of GPU cluster and high-performance Workstations after competitive bidding process as detailed in PPRA rules. The deployment of GPU accelerated High Performance Computing cluster shall provide computational strength to the SPCA and to the PAF-IAST institute. The HPC solution is critical for the scientific and industrial domains where the parallel computations shall lead to new insights, rapid decision making and solutions deployment. The applications range from basic sciences to applied science in the cross-disciplinary subjects. The HPC shall immensely facilitates the research community at Center while addressing the

complex problems such as climate change, global food security, COVID-19, run complex models and simulations related to earthquake and other natural disasters where large data sets are processed which require massive computation resources.



November 24-25, 2020

Dr. Atif Mashkooor was invited as a distinguished speaker at International Workshop and Exhibition on Artificial Intelligence in Health Care at COMSTECH Secretariat, Islamabad.



CIVIL WORK PROGRESS TILL DECEMBER 2020

SPCAI building is planned as a 7-story building with the master blue print shown below:



The civil work has been completed
50% till December 2020.

OUR INTERNATIONAL ACADEMIC PARTNERSHIPS



MoU signing at Johannes Kepler University Linz, Austria with PAF-IAST, Haripur

Photo description left to right:

Dr. Naseer Ali Khan (Former Rector PAF-IAST), Prof. Alexander Egyed (Vice Rector of Research at JKU), Dr. Mohammad Mujahid (Rector PAF-IAST), and Dr. Atif Mushkoor (MD SPCA)

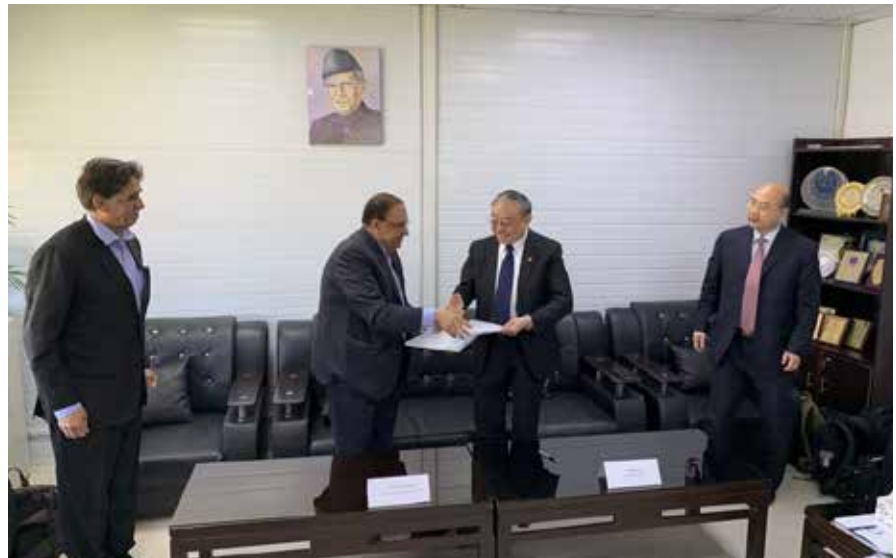


Photo description left to right:

Dr. Nasser Ali Khan (Former Rector PAF-IAST), Dr. Atif Mushkoor (MD SPCA), Dr. Bernhard Moser (Research Director SCCH), Mr. Markus Manz (CEO SCCH), Dr. Mohammad Mujahid (Rector PAF - IAST) and Mr. Rudolf Ramler (Research Manager SCCH)

MoU signing at Software Competence Center Hagenberg (SCCH), Austria with PAF-IAST, Haripur

Photo Description left to right:
Dr. Naseer Ali Khan (former
Rector PAF-IAST),
Prof. Dr. Atta-ur-Rehman
(Chairman Advisory Board
PAF-IAST), Mr. Jiancheng Lyu
(Vice President, SIAT),
Mr. Ruijun WANG (Director
General, Department of Science
and Technology of Guangdong
Province)



MoU signing at PAF-IAST, Haripur with SIAT, China



MoU signing at PAF-IAST, Haripur with GDUT, China

Photo Description left to right:
Dr. Naseer Ali Khan (Former Rector PAF-IAST), Prof. Dr. Atta-ur-Rehman (Chairman Advisory Board
PAF-IAST), Ms. Huang Rong (Director of International Office), Mr. Ruijun WANG (Director General,
Department of Science and Technology of Guangdong Province)

ACADEMIC PARTNERSHIP OBJECTIVES

The objective of the partnership with International institutes is to achieve mutual academic goals in teaching and in research and on areas of common interest in respect of Joint Academic Programs, Research Collaborations and Academic and Scholarly Exchanges, with the overall objective of establishing SPCA I

INTERNATIONAL ACADEMIC PARTNERS



The Johannes Kepler University Linz (German: Johannes Kepler Universität Linz, short: JKU) is a public institution of higher education in Austria. It is located in Linz, the capital of Upper Austria. It offers bachelor's, master's, diploma and doctoral degrees in business, engineering, law, science, social sciences and medicine.



Software Competence Center Hagenberg (SCCH) is a non-university research center that has been driving excellence in applied research in the fields of data science and software science for over 20 years. This focus enables optimal implementation of projects in the fields of digitalization, Industry 4.0 (the smart factory) and artificial intelligence. SCCH serves as an interface between international research and domestic industry, and SCCH researchers conduct world-class research.



Guangdong University of Technology (GDUT) is a provincial university in Guangzhou, Guangdong, China. The university offers a range of courses in engineering, science, technology, management, liberal arts and law, with major emphasis on the study of engineering.



**Shenzhen Institutes of
Advanced Technology,
Chinese Academy of
Science**

The Shenzhen Institutes of Advanced Technology (SIAT) of the Chinese Academy of Science (CAS) was jointly established by CAS, the Shenzhen municipal government and the Chinese University of Hong Kong in February 2006. SIAT aims to enhance the innovative capacity of the equipment manufacturing and service industries in the Guangdong-Hong Kong region, promote the development of emerging industries possessing their own proprietary intellectual property, and become a world-class industrial research institute.

FACULTY, OFFICERS AND STAFF RECRUITMENT:

The below table shows the hiring till December 2020 in comparison to the requirement per PC1 of year 1.

The second-year hiring is under process which will be finalized during January 2021



FACULTY JOINED UNDER SPCAI



Dr. Atif Mashkoor

Foreign Faculty / Managing Director
Email: atif.mashkoor@spcai.paf-iast.edu.pk

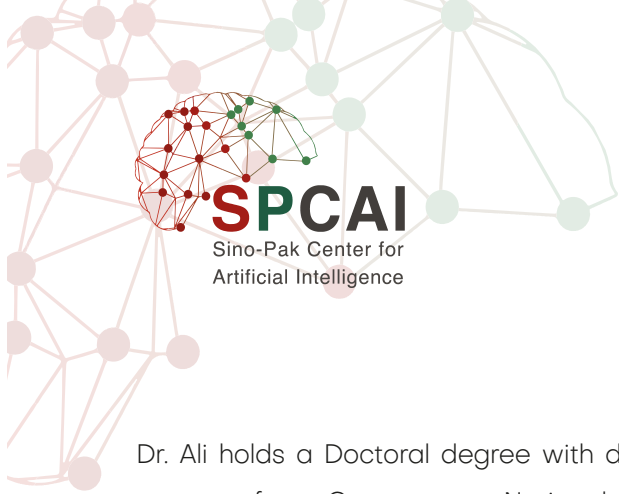
Dr. Mashkoor is the founding MD at SPCAI, a Foreign Faculty at PAF-IASST, and a Senior Research Scientist at JKU Linz, Austria. He is also an Adjunct Faculty at ICCBS – one of the premier research establishments in the developing world and a UNESCO center of excellence. He has extensively worked on European-level application-oriented research and development projects in Austria, France, and Portugal. He was the Scientific Head at SCCH, the Austrian center of excellence in data and software science, from 2012 – 2017. He holds Ph.D. from France, and M.S. from Sweden in Computer Science. Additionally, He has also studied Computational Linguistics in Spain.

Dr. Khan holds a Doctoral degree with distinction in the field of Electric Power Systems from Technical University of Vienna, Austria, obtained in 2016. He has been presently working as senior faculty at SPCAI at PAF-IASST, since October 2020. Before that he worked as Scientist from 2016 to 2020 in the leading applied research institute of Austria called Austrian Institute of Technology (AIT). There, he worked in the co-funded European and customer-oriented projects in the areas of renewable energy integration in medium and low voltage (MV, LV) distribution systems, frequency stability analysis of transmission systems, virtual inertia support from bulk energy storage systems and integrated energy systems (combining the district heating networks with power distribution networks). He is actively working on using AI for energy forecasting, machine learning for dealing with the uncertainty in energy systems and cross cutting applications using AI for decision support in urban planning, agriculture, transport, and security related areas. He is promoting AI for clean, affordable and reliable energy supply at the center of excellence.



Dr. Sohail Khan

Senior Faculty / Associate Professor
Email: sohail.khan@spcai.paf-iast.edu.pk



Dr. Ali holds a Doctoral degree with distinction in distributed systems from Gyeongsang National University, Jinju, South Korea, in the year 2020. He is holding bachelor and master's degrees from NWFP agricultural University Peshawar and Institute of Management Sciences, Hayatabad Peshawar, respectively. At the present, he has been working as Postdoc Researcher at SPCAI at PAF-IAST since August 2020.



Dr. Ihtisham Ali

Post Doc. Researcher
Sino-Pak Center for Artificial Intelligence



Dr. Fiza Murtaza

Support Faculty / Assistant Professor
Email: fiza.murtaza@spcai.paf-iast.edu.pk

Dr. Murtaza is currently serving as Support Faculty/Assistant Professor at SPCAI, PAF-IAST since August 2020. Before that she worked as Assistant Professor and Head of Computer Science Department at Women University Swabi from December 2019 to August 2020. She got her BS degree in Electrical (Computer) Engineering from COMSATS Institute of Information Technology, Abbottabad, Pakistan in 2013. She completed her MS in Computer Engineering with specialization in Signal and Image Processing from the University of Engineering and Technology (UET), Taxila, Pakistan, in 2015. She completed her PhD. in Computer Engineering with specialization in Computer Vision from UET, Taxila, Pakistan in October 2019. Her PhD research title is "Temporal human action detection in long and untrimmed videos". During her PhD studies she also worked as visiting research scholar at Multimedia & Vision Research Group, School of Electronic Engineering and Computer Science, Queen Mary University of London, United Kingdom and Cortexica Vision Systems Ltd., London, United Kingdom from March 2019 to August 2019. At SPCAI, she is currently working on the detection of suspicious/targeted human actions inside campus environment which will be further extended to other environments including banks, hospitals etc.



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