Syed Babar Ali
School of Science and Engineering

INNOVATE ENTERPRISE SERIES 1

MACHINE - INTELLIGENCE INSPIRED

INDUSTRY 4.0

SUPPORTING MANUFACTURING AND PRODUCTION INDUSTRIES IN EMBRACING DIGITALIZATION

Dr Zubair Khalid in Electrical Engineering is paving the way for aligning Pakistan's industries with Industry 4.0 standards. Working with one of the country's largest business enterprises, he has designed and deployed machine-vision and artificial intelligence-based solutions for in-situ diagnostics on the industrial production floor. Equipped with machine learning and vision algorithms, Dr. Khalid's work has improved efficiency, performance, and reliability of industrial manufacturing. As generic frameworks, these tools have been key in teleporting industries to the new era of digital compliance.

- Learning key concepts
- Evaluating current Industry 4.0 readiness level
- Architecting a detailed transformation strategy
- Delivering impact and sustaining transformation

SPECIALIZED AREAS

- Machine learning
- Big Data
- Industrial Internet of Things (IIoT)
- Computer and machine vision
- Artificial intelligence
- System modeling

INNOVATION THEMES

- Industry 4.0,
- Predictive maintenance
- Process optimisation
- Intelligent transportation
- Data-driven policy development
- Urban development

TARGET SECTORS

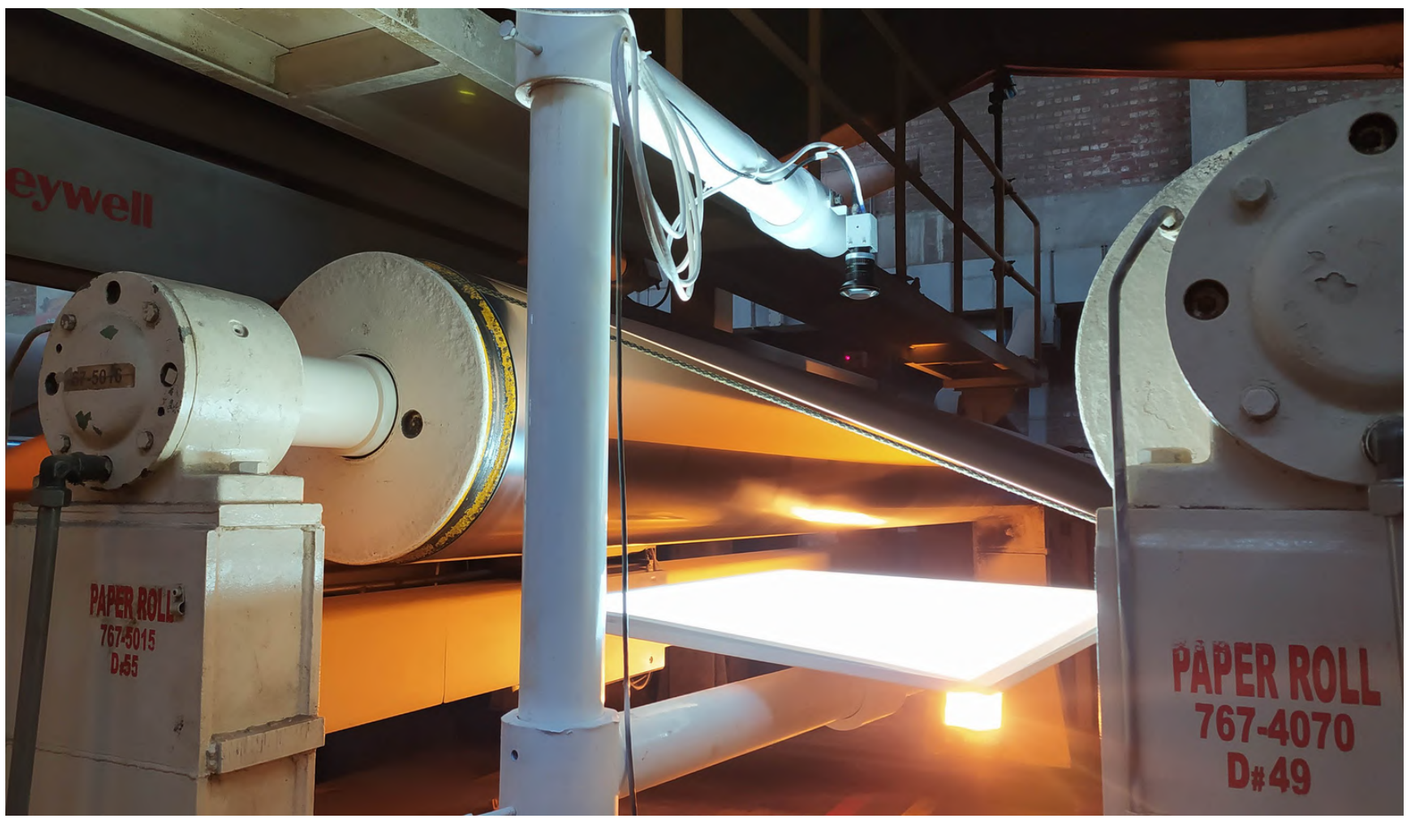
- Packaging
- Textile
- Production
- Manufacturing
- Logistics
- Transportation

SELECTED PROJECTS

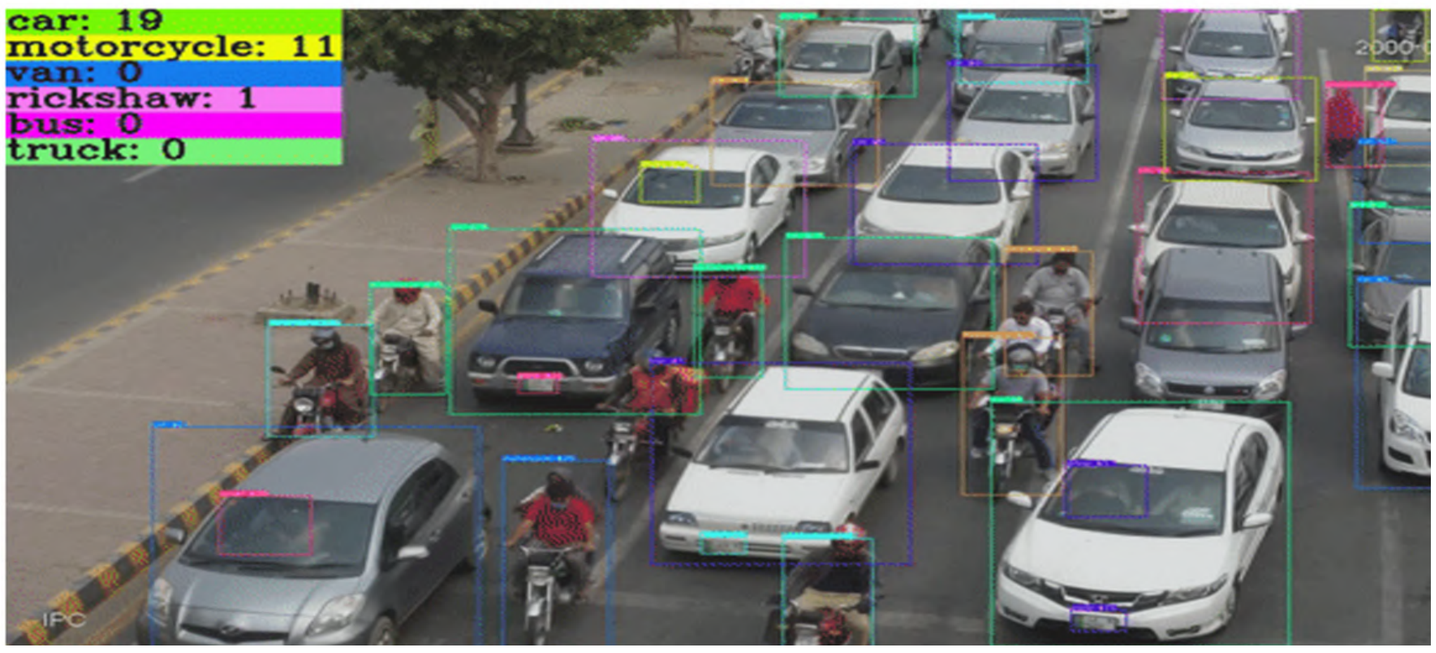
1) TETRA PAK ARABIA AND PAKISTAN, BULLEH SHAH PACKAGING

Process optimisation, quality improvement and predictive maintenance

- Development of a framework for the Industry 4.0 readiness assessment of industries
- Real-time online spot detection on the packaging board
- Detection of edge cracks during production using machine vision and machine learning
- In situ trim edge width estimation during polymer extrusion
- Production materials mixing quality barrier using machine vision and AI
- Traceability analysis from supplier to end-user diagnostics
- Quality control for labeling of products on the industrial production floor
- Identification of production sweet spots using big data analytics and optimisation
- Trainings/Summits for industries on ‘Machine Learning’ and ‘Digitalization’



2) PARTNERS: HEC TECHNOLOGY DEVELOPMENT FUND



- Motorway to Safety: Design and development of an intelligent, low-cost system for active traffic management and efficient law enforcement on National Highways and Motorways

- Saving lives through AI and computer vision: Dr. Zubair Khalid’s traffic engineering solutions promise to address traffic congestion in urban areas and to improve road safety on 35 thousand kilometers of our national highways

ABOUT

Dr Zubair Khalid is Associate Professor in the Department of Electrical Engineering at the Syed Babar Ali School of Science and Engineering, Lahore University of Management Sciences (LUMS), Lahore, Pakistan. He is also a the Director of Smart Data, Systems and Applications Lab.

He comes to LUMS after brief sojourns with the Department of Electrical Engineering, University of Engineering and Technology, Lahore, and the Research School of Engineering, College of Engineering and Computer Science (CECS), The Australian National University (ANU), from where he completed his PhD.

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