

Monthly Newsletter

By the AI Research Centre, Woxsen University

Welcome to the **AI Research Centre** at Woxsen University, a leading hub dedicated to pushing the boundaries of artificial intelligence research and innovation. Located within one of India's most dynamic academic ecosystems, the Centre is focused on leveraging AI to create transformative solutions that address real-world challenges and promote societal advancement. Our interdisciplinary team of professors, researchers, executive fellows, and students actively engages in cutting-edge work across areas such as machine learning, natural language processing, computer vision, robotics, blockchain, cybersecurity, and the metaverse. With a clear vision to become a globally recognized centre of excellence, we are committed to fostering ethical AI development, promoting interdisciplinary collaboration, and building impactful partnerships with industry, academia, and government. Through our mission-driven efforts, the AI Research Centre at Woxsen University is shaping the future of technology and empowering the next generation of innovators.



Human-Centered AI for Aviation Safety

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Discover Computing

RESEARCH

Open Access



Machine learning classification of behavioral patterns predicts cognitive accountability failures in human-AI decision systems validated across aviation domains

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Abstract

We propose a machine learning framework to predict human decision failures in AI-assisted systems using automated analysis of behavioral patterns. Ensemble classifiers trained on 127 engineered features achieve 89% accuracy (AUC=0.89) in identifying accountability deficits across 2.3 million humans-AI interactions drawn from three studies: controlled laboratory experiments (n=847), high-fidelity flight simulations (n=134), and longitudinal operational observations at 29 aviation and ground sites over 60 months. The feature set operationalizes five behavioral markers—response latency profiles, confidence calibration deviations, override propensity patterns, situational awareness degradation metrics, and cognitive load redistribution indicators—capturing complementary aspects of human-AI interaction. The ensemble, combining Random Forest, Gradient Boosting and Logistic Regression, also supports early prediction (AUC=0.76 using the first 10 decisions), enabling pre-emptive intervention before performance degrades. SHAP-based interpretability analysis indicates that situational awareness degradation contributes the largest share of predictive power, and the overall framework is applicable to real-time monitoring in AI advisory systems that require human supervision.

Keywords Machine learning, Human-AI interaction, Behavioral pattern recognition, Ensemble classification, Decision support systems, Feature engineering, Cognitive accountability, Automation bias, Predictive modeling, Real-time monitoring

As artificial intelligence becomes increasingly integrated into aviation systems, maintaining human oversight remains critical for safety and accountability. The discussion highlights the importance of a human-in-the-loop approach, where AI supports decision-making while trained professionals retain control over critical operations. Combined with strong AI governance frameworks, this approach helps ensure transparency, reliability, and risk management in safety-critical environments. The evolving relationship between humans and intelligent systems is set to play a key role in shaping the future of aviation and other high-stakes industries.

New Research on Aviation Demand Resilience



Contents lists available at ScienceDirect

Journal of Air Transport Management

journal homepage: www.elsevier.com/locate/jairtraman

Modelling regime-switching aviation demand under recurrent global disruptions: A joint Passenger–Cargo resilience and forecasting study of Heathrow Airport

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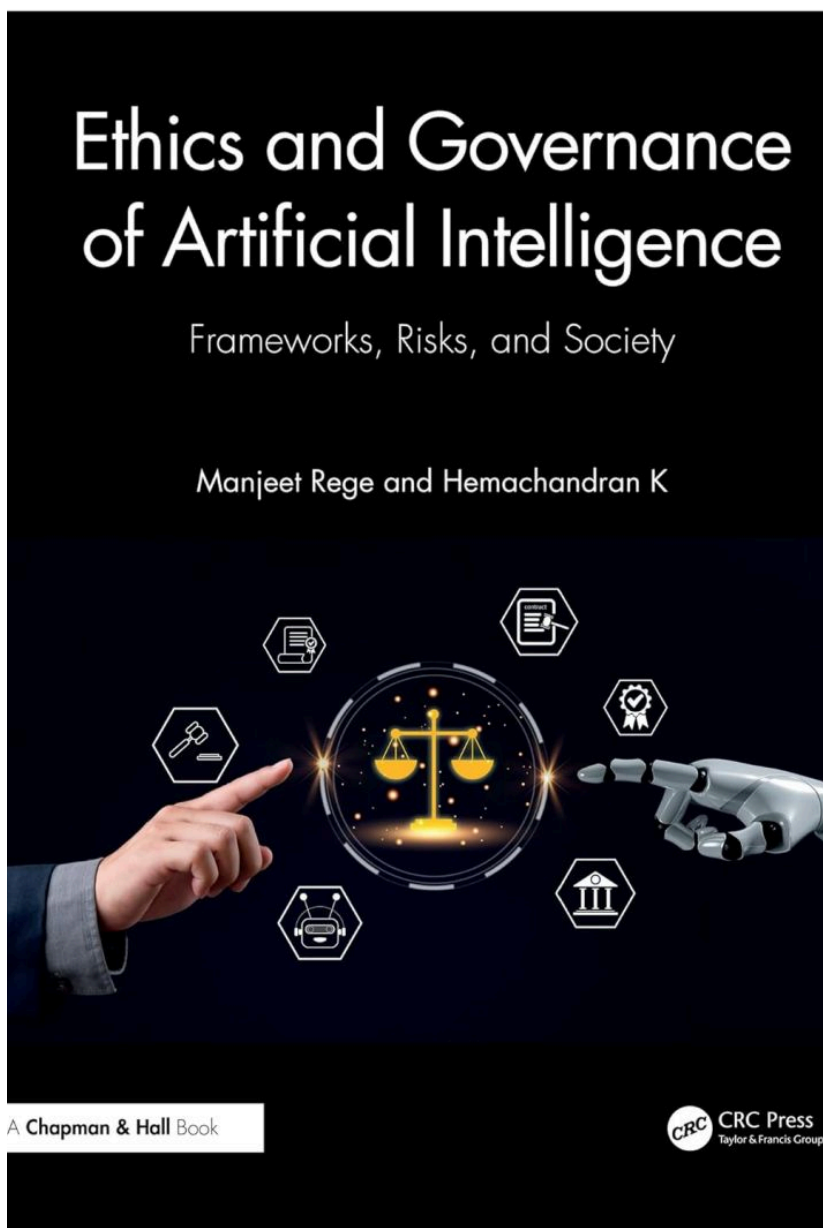
Aviation demand forecasting
Passenger–cargo resilience
Structural break detection
Regime-switching demand
Hub airport planning
Disruption-aware modelling
Heathrow airport

ABSTRACT

This study develops a disruption-aware, region-segmented, joint passenger–cargo resilience and forecasting framework for Heathrow Airport using 20 years of monthly data spanning multiple global crises. Heathrow is examined as a dual passenger–cargo hub whose traffic has been repeatedly affected by the 2008 global financial crisis, Brexit, and the COVID-19 pandemic. The dataset comprises market-wise passenger volumes and cargo tonnage for key regions, enabling long-horizon analysis of traffic evolution and structural change. Methodologically, the study combines structural break detection (including Chow and Bai–Perron tests), a market-wise resilience index based on shock depth, recovery speed, and volatility, passenger–cargo decoupling analysis via rolling correlation and lead–lag patterns, and disruption-aware forecasting models (ARIMA, Prophet, and XGBoost) for a 2026–2035 horizon. Results show that COVID-19 induced persistent regime shifts rather than temporary shocks, with cargo traffic displaying systematically higher and faster resilience than passenger traffic and clear post-2020 decoupling of cargo from passenger demand in several regions. Disruption-aware models reduce long-term forecast errors by approximately 25–40% relative to conventional time-series baselines, particularly around shock periods. The study contributes an integrated empirical framework for understanding regime-switching aviation demand and offers hub-level strategic insights for capacity planning, cargo infrastructure investment, and market diversification under recurrent disruption.

A recent study published in the Journal of Air Transport Management examines how aviation demand responds to major global disruptions. Focusing on Heathrow Airport's passenger and cargo markets, the research demonstrates the importance of recognizing structural breaks rather than relying on smooth trend assumptions for long-term forecasting. By integrating break detection, resilience indexing, and disruption-aware forecasting, the framework provides a more realistic understanding of demand behavior in an increasingly uncertain and shock-prone global environment.

Responsible AI and Governance – A Structured Guide to Ethical AI



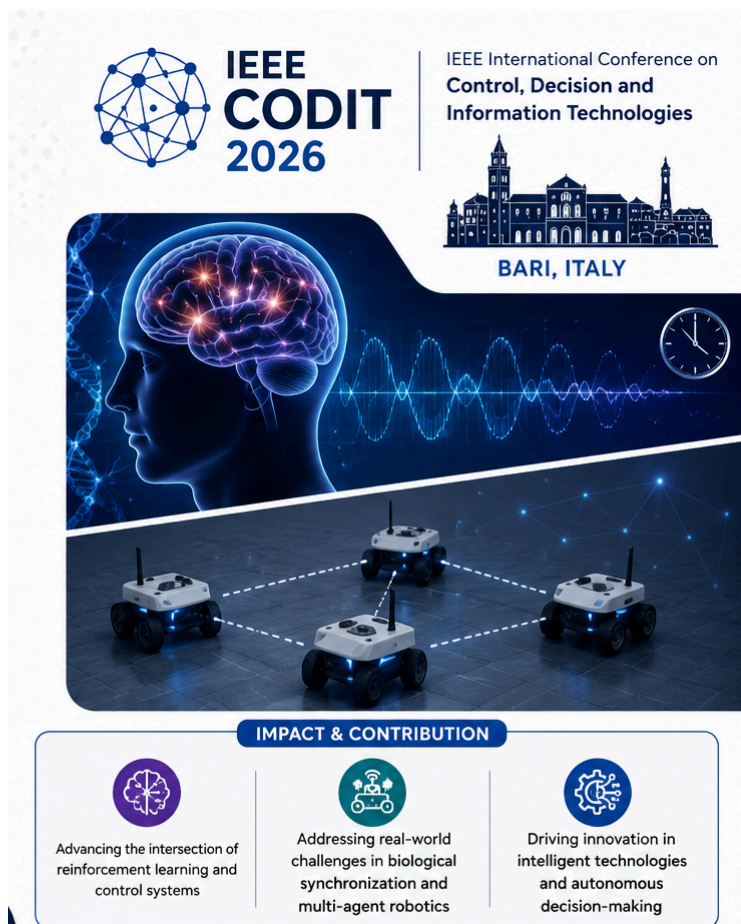
The featured book on Responsible AI and Governance explores the principles required to build trustworthy and ethical artificial intelligence systems. It covers key areas such as transparency, fairness, accountability, and regulatory frameworks that guide the safe deployment of AI technologies. The book emphasizes the importance of balancing innovation with responsibility, ensuring AI systems align with societal values and minimize risks like bias and misuse.

Research Contributions Accepted at IEEE CODIT 2026

A significant research milestone was achieved with the acceptance of two papers at the IEEE International Conference on Control, Decision and Information Technologies (CODIT 2026), to be held in Bari, Italy. These contributions highlight innovative applications of reinforcement learning in both biological and engineering systems.

Accepted Papers:

- Reinforcement Learning for Synchronization Analysis of Biological Rhythms
- Robust Formation Control of Wheeled Mobile Robots Using DDPG and TD3 Algorithms



Together, these studies demonstrate ongoing advancements at the intersection of the (RL) reinforcement learning, control systems, and intelligent technologies, addressing challenges in biological synchronization and autonomous robotic coordination while contributing to the broader field of AI-driven decision-making and control.

Summer Camp on Robotics and Artificial Intelligence



A summer camp focused on robotics and artificial intelligence is being organized to provide hands-on learning opportunities for students and enthusiasts. The program is designed to introduce core concepts of AI, machine learning, and robotics through practical sessions, interactive projects, and guided mentorship. Participants gain exposure to real-world applications while developing problem-solving and technical skills. Such initiatives help bridge the gap between theoretical knowledge and practical implementation, encouraging young learners to explore careers in emerging technologies like AI, automation, and intelligent systems.

AI and Autonomous Vehicles: Driving the Future of Intelligent Mobility



Artificial intelligence is playing a transformative role in the development of autonomous vehicles by enabling smarter decision-making, real-time environmental awareness, and enhanced safety systems. Advances in machine learning, computer vision, and sensor technologies are helping vehicles navigate complex road conditions with greater accuracy and efficiency. As research and innovation continue to evolve, autonomous mobility is expected to improve transportation systems, reduce human error, and support the creation of safer, more intelligent, and connected driving experiences for the future.

AIKP 2026: Fostering Global Collaboration in AI Research



The banner for AIKP'26 features a dark blue background with a subtle pattern of squares. On the left, the text 'AIKP'26' is prominently displayed in large white and blue letters, followed by 'WELCOMING OUR PARTNERS FOR 2026 EDITION' in blue. Below this, the dates '19th - 20th, August 2026' and the location 'Woxsen University, Hyderabad, India' are listed, along with a 'Hybrid' icon. On the right, a white-bordered box contains logos for 'CORPORATE PARTNERS' (NAAI and a gold coin) and 'ACADEMICS PARTNERS' (University of St. Thomas, Universidad del Rosario, and ENAE). At the bottom right, logos for 'FUDAN UNIVERSITY', 'UNIVERSITY OF THE SAHARA', 'ACCRA TECHNICAL UNIVERSITY', and 'Woxsen University' are visible. The Woxsen University logo is also in the top right corner.

AIKP'26 | 6th International Conference on Artificial Intelligence & Knowledge Processing

WELCOMING OUR PARTNERS FOR 2026 EDITION

19th - 20th, August 2026 | Woxsen University, Hyderabad, India | Hybrid

CORPORATE PARTNERS

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University of St. Thomas, Universidad del Rosario, ENAE, FUDAN UNIVERSITY, UNIVERSITY OF THE SAHARA, ACCRA TECHNICAL UNIVERSITY, Woxsen University

AIKP 2026 aims to bring together researchers, academics, and industry professionals from around the world to exchange ideas and advance the field of artificial intelligence and knowledge processing. By encouraging interdisciplinary collaboration and knowledge sharing, the conference provides a platform for discussing emerging trends, innovative methodologies, and real-world applications of AI. Such global engagement helps strengthen research networks, accelerate innovation, and contribute to the responsible development of intelligent technologies that address complex challenges across diverse domains.

Advancing Intelligence Through Practical AI Systems

Artificial intelligence is kind of steadily moving away from experimental models and into real world, production ready systems that can reason, adapt, and do complex tasks with better reliability. Lately the conversation has been leaning harder on creating efficient and scalable



The poster is for an event titled "AI GOVERNANCE in Healthcare & Agriculture". It features a dark blue background with a network of white dots and lines. In the top left is the "AI RESEARCH CENTRE" logo. In the top right is the "WOXSEN UNIVERSITY" logo. The main title "AI GOVERNANCE" is in large white letters, with "in Healthcare & Agriculture" in smaller white letters below it. A circular portrait of Sarvesh Singh, CEO of Lifesciences & Pharma, Govt of Telangana, is on the right. Below the title, it says "Chief Guest Sarvesh Singh" in yellow and white text. A blue banner below that says "Where Innovation Meets Responsibility". At the bottom left, it says "Open for Registration" next to a QR code. At the bottom right, it lists the date "Thursday 9th July 2026", location "Woxsen University, Hyderabad", and time "9:30 AM - 4:00 PM". At the very bottom, it provides the website "www.aircwou.in" and email "airesearchcentre@woxsen.edu.in".

AI GOVERNANCE
in Healthcare & Agriculture

Chief Guest
Sarvesh Singh
CEO Lifesciences & Pharma,
Govt of Telangana

Where Innovation Meets Responsibility

Open for Registration

Thursday
9th July 2026

Woxsen University,
Hyderabad

Time
9:30 AM - 4:00 PM

www.aircwou.in airesearchcentre@woxsen.edu.in

AI solutions that are not just basic automation. Instead they bring real decision-making ability, like, actual value. And as the research keeps going the emphasis seems to slide toward AI agents, multimodal perception, and domain specific applications that can work in shifting or dynamic environments without falling apart. Overall this looks like a clear direction toward smarter systems that are more practical, more useful in day to day operations and industry use cases, and more deeply wired into the way workflows actually happen.

AIKP 2026 – Call for Participation in Knowledge Processing Research



AIKP26 AI RESEARCH CENTRE

WOXSEN UNIVERSITY

Hosting by AI Research Centre - Woxsen University, India

AIKP'26 | 6th International Conference on Artificial Intelligence and Knowledge Processing

19 - 20 August 2026 | Woxsen University, India | Mode: Hybrid

OUR CONFIRMED SPEAKERS

 Dr. Imed Ben Dhaou Full Professor / Secretary of the scientific council Computer Science, Dar Al-Hekma University	 Prof. Abejide Ade-Ibijola Full Professor: Artificial Intelligence and Applications Johannesburg Business School (JBS)	 Prof. Thomas Heinrich Musiolik Chair Professor Prof. Marketing & Technology, University of Europe for Applied Sciences, Germany	 Prof. Alvaro David Ojuela Canon Associate Professor School of Medicine & Health Sciences Universidad del Rosario	 Dr. Anil Pise Sr. Data Scientist X-idian, Johannesburg, Gauteng, South Africa
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YOUR VOICE COULD BE NEXT ON STAGE

Inspire the future by joining this year's editions of AIKP as a key note speaker

Scan for Registration



Deadline 10th June









The AIKP 2026 initiative invite researchers, professionals and innovators to chip in for pushing artificial intelligence forward when it comes to knowledge processing. The emphasis is on building smarter systems that can manage, organize, and pull out useful understanding from huge streams of information. This platform also tries to spark cooperation between academia and industry so people can test fresh approaches in AI powered reasoning and data comprehension. AIKP 2026 wants to gather different viewpoints, to help shape what knowledge based AI systems will become and how they can be used in real life.

Esteemed Members

AI Research Centre, Woxsen University

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DR. HEMACHANDRAN K

DIRECTOR

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OUTREACH MANAGER

SHAIK ANJUMABI

INNOVATION AND COMMERCIALISATION



Our Vision

To become a globally recognized hub for pioneering AI research and innovation, driving transformative solutions that address real-world challenges and contribute to societal welfare.

Our Mission

To advance the field of artificial intelligence through cutting-edge research, interdisciplinary collaboration, and ethical development, fostering an environment that attracts top talent and cultivates partnerships with industry, academia, and government.

Global Footprint



About Us

Welcome to the AI Research Centre at Woxsen University, a renowned hub committed to pushing the boundaries of AI research and development. Situated in a vibrant academic setting, our facility is dedicated harnessing the revolutionary power of AI technologies to transform industries and improve social well-being. Our AI Research Centre boasts a team of professors, researchers, Executive Fellows, and students who are deeply involved in cutting-edge areas such as Machine Learning, Natural Language Processing, Computer Vision, Robotics, Blockchain, Cybersecurity, and the Metaverse. Our aim is to create innovative AI solutions that address practical issues, promoting advancement across various industries.

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AI RESEARCH CENTRE

Our Projects

- Student Skill Enhancement (Meta + Gen AI) Game
- Metaverse Odyssey (SDG) VR
- Transcripts Verification System using Blockchain
- Woxsen Campus Mart
- Woxsen Campus Tour VR
- Mobile Bargaining System Using AI in Metaverse
- Iron Man Suit for Fire Detection
- Blockchain Stock Exchange
- Necrobotics
- Real time weather monitoring
- Healthcare management system

TRY DEMO



Core Pillars

- Research and Development Division
- Product Development Division
- Technical Documentation / Research Publication Division

Strategic Partners



Our Niche

- ✓ Artificial Intelligence and Machine Learning
- ✓ Robotics, Necrobotics
- ✓ IoT and Embedded Systems
- ✓ Virtual and Augmented Reality - Metaverse
- ✓ Software and Web Development
- ✓ Quantum Computing
- ✓ Natural Language Processing / LLM Models
- ✓ Biomedical Signal Processing
- ✓ Human Computer Interaction
- ✓ Blockchain and Web3
- ✓ Geospatial Information