Dr. Hannan Ejaz Keen

Expert in **Perception, Artificial Intelligence, and Robotics**

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Research Interests
Artificial Intelligence
Deep Learning
Reinforcement Learning
Generative AI
Computer Vision
Perception
Sensor Fusion
Mapping
Autonomous Vehicles
Robotics

About Me

AI and Perception Engineer with extensive experience in computer vision, deep learning, sensor fusion, and autonomous mobile robotics. Proven track record of developing cutting-edge AI models, securing research funding (€1M+), and leading interdisciplinary projects. Passionate about leveraging AI for robotics, autonomous navigation, and smart city applications.

Professional Experience

Senior Researcher (Mar 2024 – Till Date)

Research and Innovation at Xitaso GmbH

- Leading German ministry-funded research projects:
  VALISENS – A smart city project; developed multi-sensor multi object detection and tracking pipeline for autonomous vehicles. - Link
  ENGEL – A safe flight navigation project; Developing a self-adaptive multi-modal perception system for safe helicopter landing. - Link
- Managing team of 10 researchers in the **Autonomous Systems** division.
- Writing research publications, proposals and organizing resource allocation, cross-departmental collaboration, and long-term roadmaps.
- **Recent Achievement:** Best Student Paper award in *VEHITS 2025*.

Research Associate (Sep 2019 – Feb 2024)

Robotics Research Lab at RPTU Kaiserslautern Landau

- Developed multi-modal perception system for autonomous off-road vehicles using computer vision and deep learning techniques.
- Developed HMI for driverless campus bus using novel perception system to detect and avoid vulnerable road users (VRUs).
- Published peer-reviewed papers in ICRA, IROS, and top-tier robotics conferences.
- Led grant proposals securing €1M+ in research funding for AI-driven robotics projects
- Contributed to multiple advanced research projects:
  Nalamki - Conducted multispectral and heat signature analysis using multispectral imagery using image processing techniques.
  Ponton Boot– POBO - Developed perception architecture for surface water vehicles using machine vision and deep learning techniques.
  JD Mapping - Delivered elevation mapping pipeline using multi-modal sensory data captured via aerial drones and field tractors.
  Autonomous Campus Bus – Developed multi-modal fusion techniques for offroad vehicle to safely navigate by avoiding VRUs.

Lecturer/Associate Lecturer (Feb 2014 – Jan 2018)

Computer Science Department at University of Central Punjab Lahore

SOFT SKILLS

Problem Solving
Focused
Consistent
Team Player
Research
Adaptability
Time Management

LANGUAGES

Urdu (Native)
Punjabi (Mother tongue)
English (C1 Level)
German (B1 Level)

Educational Background

(Feb 2018 – July 2024)

Doctor of Philosophy (Ph.D.) in Computer Science

Robotic Research Lab – RPTU Kaiserslautern Landau
Dissertation: Traversability Mapping in flooded environment using unmanned surface vehicle. Link
Keywords: Sensor fusion, Computer Vision, Deep Learning, Generative AI, Perception, Mapping

MS in Electrical Engineering (Sep 2014 – June 2016)

Lahore University of Management Sciences
Dissertation: Conflict Avoidance among multiple Unmanned Aircrafts using Reinforcement Learning.
Relevant Courses: Robot Motion Planning, Stochastic Processes, Mobile Robotics

BSc. in Electrical Engineering (Sep 2009 – Oct 2013)

University of Engineering and Technology Lahore

Technical Skills

- **Computer Vision & AI:** Object Detection, Multi-object Tracking Segmentation, SLAM, Sensor Fusion, Mapping, Generative AI.
- **Deep Learning Frameworks:** TensorFlow, PyTorch, OpenCV, YOLO, Faster R-CNN, Transformers
- **Programming & Tools:** Python, C++, Bash, OpenCV, MATLAB, ROS,/ROS2, FINROC, Git, Docker, Confluence, Jira, MS Office/Sharepoint, DrawIO, Latex
- **Sensors & Hardware:** LiDAR, Stereo Cameras, Multispectral Cameras, Thermal Cameras, Multibeam Sonar, Ground Panetrating Radar, IMU, GNSS.
- **Drones:** Octocopters, Basilisk and In-house build Astrider (surface vehicles), TUK Campus Bus.
- **Development Methodologies:** Agile, Scrum, CI/CD, MLOps

Research Grants

1. **BMWK:** Valisens (€550k, 2023-2025), ENGEL (€600k, 2024-2028), NaLamKI (€420k, 2021-2024), Ponton Boot (€300k, 2019-2021)
2. **DAAD Grants:** FYEOAR (€50k, 2019-20), AMS-HyRes (€50k, 2020-21), CoPest (€50k, 2022-23), Abiotic Stress (€50k, 2024-25)

Trainings

- "Understanding the Ground Penetrating Radar" from RadarTeam Sweden AB, 2022.
- "Drone Flight Training and License", 2020.
- "How to Recognize Phishing?", 2024
- "Information Security", 2024
- "Basics Secure Software Development", 2024

References

- Shall be furnished upon request.