Muhammad **Aqeel**

Postdoctoral Research Fellow · Computer Vision & Anomaly Detection

Dept. of Engineering for Innovation Medicine, University of Verona, Italy

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Research Interests

My research is centered on anomaly detection for industrial inspection, with a focus on unsupervised and zero-shot settings where labeled defect data is not available. Over time my work has naturally expanded toward generative models and vision-language approaches, driven by the need to handle data scarcity and improve generalization across unseen defect categories. Recently I am also exploring video understanding and multimodal summarization, though my main research remains in anomaly detection.

Employment

University of Verona — *Verona, Italy*
Postdoctoral Research Fellow — *2026 – Present*

University of Ljubljana — *Ljubljana, Slovenia*
Visiting Researcher — *Jun. – Nov. 2025*

University of Verona — *Verona, Italy*
Teaching Assistant — *2023 – 2025*

Huazhong Univ. of Science & Technology — *Wuhan, China*
Research Assistant — *2021 – 2022*

Education

University of Verona — *Verona, Italy*
Ph.D. in Computer Science — *2022 – 2025*
Supervisors: Prof. Francesco Setti & Prof. Marco Cristani

Beijing Univ. of Posts & Telecommunications — *Beijing, China*
M.Sc. in Computer Science — *2019 – 2021*
Supervisor: Prof. Xiaohong Liu

PMAS Arid Agriculture University — *Rawalpindi, Pakistan*
B.Sc. in Computer Science — *2013 – 2017*

Publications

Journal Articles

Semantic Parsing for Aspect Based Sentiment Analysis
M. Aqeel & F. Setti — *2025*
IEEE Access, Vol. 13, pp. 127322–127334

Conference Proceedings

Anomaly-Aware Vision-Language Adapters for Zero-Shot Anomaly Detection
M. Aqeel, M. Nazir, U. Khan, M. Cristani & F. Setti — *2026*
IEEE Intl. Conf. on Image Processing (ICIP)

Multimodal Abstractive Summarization of Instructional Videos with Vision-Language Models
M. Nazir, R. Zhang, M. Aqeel & F. Setti *2026*
Intl. Conf. on Pattern Recognition (ICPR)

Towards Real Unsupervised Anomaly Detection via Confident Meta-Learning
M. Aqeel, S. Sharifi, M. Cristani & F. Setti *2025*
IEEE/CVF Intl. Conf. on Computer Vision (ICCV)

Robust Anomaly Detection in Industrial Environments via Meta-Learning
M. Aqeel, S. Sharifi, M. Cristani & F. Setti *2025*
IEEE/CVF Intl. Conf. on Computer Vision (ICCV)

A Contrastive Learning-Guided Confident Meta-Learning for Zero-Shot Anomaly Detection
M. Aqeel, D. Skočaj, M. Cristani & F. Setti *2025*
IEEE/CVF Intl. Conf. on Computer Vision (ICCV)

ExDD: Explicit Dual Distribution Learning for Surface Defect Detection via Diffusion Synthesis
M. Aqeel, F. Leonardi & F. Setti *2025*
ICIAP 2025, Springer

RoadFusion: Latent Diffusion Model for Pavement Defect Detection
M. Aqeel, K. D. Bellete & F. Setti *2025*
ICIAP 2025, Springer

Latent Space Synergy: Text-Guided Data Augmentation for Direct Diffusion Biomedical Segmentation
M. Aqeel, M. Nazir, Z. Ruan & F. Setti *2025*
ICIAP Workshops 2025, Springer

Diffusion-Based Data Augmentation for Medical Image Segmentation
M. Nazir, M. Aqeel & F. Setti *2025*
IEEE/CVF Intl. Conf. on Computer Vision (ICCV)

Self-Supervised Iterative Refinement for Anomaly Detection in Industrial Quality Control
M. Aqeel, S. Sharifi, M. Cristani & F. Setti *2025*
VISAPP 2025, SCITEPRESS, pp. 173–183

Meta Learning-Driven Iterative Refinement for Robust Anomaly Detection in Industrial Inspection
M. Aqeel, S. Sharifi, M. Cristani & F. Setti *2024*
ECCV 2024, Springer, pp. 445–460

Self-supervised Learning for Robust Surface Defect Detection
M. Aqeel, S. Sharifi, M. Cristani & F. Setti *2024*
DeLTA 2024, Springer, pp. 164–177

Diffusion-Based Image Generation for In-Distribution Data Augmentation in Surface Defect Detection
L. Capogrosso, F. Girella, F. Taioli, M. D. Chiara, M. Aqeel, F. Fummi, F. Setti & M. Cristani *2024*
VISAPP 2024, SCITEPRESS, pp. 409–416

Funding & Grants

University of Verona *Verona, Italy*
PNRR Funding for PhD *2022 – 2025*

University of Ljubljana *Ljubljana, Slovenia*
Mobility Research Grant *2025*

Beijing Univ. of Posts & Telecommunications *Beijing, China*
Chinese Government Scholarship (CSC) for Master *2019 – 2021*

Awards & Honours

Workshop on CV and Generative Models for Medical Imaging, ICIAP 2025 *Rome, Italy*
Certificate of Oral Presentation *2025*

Academic Service

Reviewer – Journals

IEEE Transactions on Multimedia

Reviewer

Neural Computing and Applications

Reviewer

Applied Soft Computing

Reviewer

Reviewer – Conferences

IEEE/CVF International Conference on Computer Vision (ICCV)

Reviewer *2025*

European Conference on Computer Vision (ECCV)

Reviewer

IJCAI-ECAI

Reviewer

Intl. Conf. on Computer Vision Theory and Applications (VISAPP)

Reviewer *2025*

Conferences & Presentations

ICIAP 2025

Oral, Poster & Invited Talk

- International Conference on Image Analysis and Processing · Rome, Italy · Sep. 2025
- Oral: *RoadFusion: Latent Diffusion Model for Pavement Defect Detection*
- Poster: *ExDD: Explicit Dual Distribution Learning for Surface Defect Detection*
- Oral: *Latent Space Synergy* – CVGMMI Workshop
- Invited Talk – T4S Workshop (Traffic & Street Surveillance for Safety and Security)

ECCV 2024

Oral Presenter

- European Conference on Computer Vision · Milan, Italy · Sep.–Oct. 2024
- Oral: *Meta Learning-Driven Iterative Refinement for Robust Anomaly Detection* – VISION Workshop

VISAPP 2025

Oral Presenter

- Intl. Conf. on Computer Vision Theory and Applications · Porto, Portugal · Feb.–Mar. 2025
- Oral: *Self-Supervised Iterative Refinement for Anomaly Detection in Industrial Quality Control*

VISAPP 2024

Poster Presenter

- Intl. Conf. on Computer Vision Theory and Applications · Rome, Italy · Feb. 2024
- Poster: *Diffusion-based Image Generation for In-distribution Data Augmentation in Surface Defect Detection*

Memberships

CVPL – Italian Association for Computer Vision, Pattern Recognition and Machine Learning *Italy*

Member *Since 2025*

Teaching Assistantship

University of Verona

Teaching Assistant

Verona, Italy |
2023–2025

- Computer Vision and Machine Learning, Dept. of Engineering for Innovation Medicine

Technical Skills

Languages	Python, C, C++, Java, MATLAB
Frameworks	PyTorch, TensorFlow, Keras, Hugging Face
Tools	Git, Docker, LaTeX, Anaconda, PyCharm, Visual Studio
Databases	MySQL, Oracle, Neo4j
Operating Systems	Linux, macOS, Windows

Languages

Urdu / Punjabi	Native
English	Proficient (C2)
Italian	Basic (A2)
Chinese	Basic (A2)

Referees

Prof. Francesco Setti *Verona, Italy*

Associate Professor

Dept. of Engineering for Innovation Medicine, University of Verona · francesco.setti@univr.it

Prof. Marco Cristani *Verona, Italy*

Professor

Dept. of Engineering for Innovation Medicine, University of Verona · marco.cristani@univr.it

Prof. Liu Xiao Hong *Beijing, China*

Associate Professor

School of Computer Science, Beijing Univ. of Posts & Telecommunications · xiaohongliu@bupt.edu.cn