Pankaj **Mishra** *(Ph.D.)*

Friuli-Venezia Giulia, Italy

Pankajmishra000@gmail.com | +39-3201434039/ +91-7485890567 | pankaj-mishra-86898140

pankajmishra000 | /pankajmishra000 | pankajmishra000.github.io/000/

Summary

I am a Ph.D in the field of Computer vision and Artificial Intelligence. My daily work includes developing models that can do real-life complex tasks, like classification, regression and generation tasks in industrial application domain.

Research area - Artificial Intelligence, Computer Vision, Deep Learning, Machine Learning, Data Analytics, Anomaly Detection

Apart from this I also practices and teaches Yoga regularly and practices a healthy and active lifestyle.

Publications

Journal

A Neural Network for Image Anomaly Detection with Deep Pyramidal Representations and Dynamic Routing.
***Mishra P.**, Piciarelli C, Foresti GL.*
International Journal of Neural Systems. 2020 Oct;30(10):2050060. DOI: 10.1142/s0129065720500604.

Supervised Anomaly Detection with Highly Imbalanced Datasets Using Capsule Networks
*Piciarelli, C., **Mishra P.**, and G. l. Foresti.*
International Journal of Pattern Recognition and Artificial Intelligence (2021): 2152010.DOI: 10.1142/S0218001421520108

Comparative study of segmentation nets and patch-based methods for anomaly detection in industrial scenarios
***Mishra P.**, R.Verk, C. Piciarelli, G.L. Foresti (2021)*
Engineering Applications of Artificial Intelligence, The International Journal of Intelligent Real-Time Automation. (submitted)

MeTAL- Masked Transformer for Anomaly Localization
Axel N., **Mishra P.**, G.L. Foresti, C. Piciarelli (2021)
IEEE Transactions on Industrial Informatics. (submitted)

Conferences

"VT-ADL: A Vision Transformer Network for Image Anomaly Detection and Localization"
Mishra P., R. Verk, D. Fornasier, C. Piciarelli, G.L. Foresti
30th IEEE/IES International Symposium on Industrial Electronics (ISIE)
Kyoto, Japan, June 20-23, 2021

"Image Anomaly Detection by Aggregating Deep Pyramidal Representations"
Mishra P., Piciarelli C., Foresti G.L.
In: Del Bimbo A. et al. (eds) Pattern Recognition. ICPR International Workshops and Challenges. ICPR 2021. Lecture Notes in Computer Science, vol 12664. Springer, Cham. https://doi.org/10.1007/978-3-030-68799-1_51, March 05, 2021

Image Anomaly Detection with Capsule Networks and Imbalanced Datasets
Piciarelli C., Mishra P., Foresti G.L. (2019)
In: Ricci E., Rota Bulò S., Snoek C., Lanz O., Messelodi S., Sebe N. (eds) Image Analysis and Processing – ICIAP 2019. ICIAP 2019. Lecture Notes in Computer Science, vol 11751. Springer, Cham. https://doi.org/10.1007/978-3-030-30642-7_23, September 02,2019

Education

Università degli Studi di Udine

Doctor of Philosophy - PhD, Artificial Intelligence and Computer Vision (2018 – 2021)

Supervisor: *Prof. Gian Luca Foresti*

The Ph.D. is intended to develop novel "Deep Neural Network" for complex classification tasks in real world industrial scenarios. Work majorly focuses on anomaly detection and computer vision. Thesis – ***"Deep Neural Networks for Image Anomaly Detection: Application in Real World Industrial Scenario"***

- ***Industrial Sponsored researcher (by beanTech srl)***
- ***7 strong publications in 3 years of Ph.D.***

InterMaths : Erasmus Mundus Joint Master Degree & Double Degree Programmes

Master's in Interdisciplinary mathematics in Engineering and Finance. Spent two years in two different universities.

Thesis: "Some transformation of Multivariate Normal Random Vectors and Their Application to Statistics"

Supervisor: *Dr Agnieszka Kulawik*

University of Silesia in Katowice (5/5)

Master's degree, Applied Mathematics in Finance (2017 – 2018)

Università degli Studi dell'Aquila (98/110)

Master's Degree, Mathematical Modelling in Engineering (2016 – 2017)

Uttar Pradesh Technical University

B.Tech, Aeronautical Engineering (2009 – 2013)
Marks: 80.08%

Army School Danapur Cantt, Patna, Bihar

AISSCE- {12TH} CBSE BOARD, Math's + Computers 2007 – 2009
Marks – 83.2%

Army School Danapur Cantt, Patna, Bihar

AISSE {10TH} CBSE BOARD 2006 – 2007
Marks – 88.4%

Some Noted Projects

VT-ADL Vision Transformer for Image Anomaly Detection and Localization (See GitHub above)	Research project Developed novel method for image anomaly detection and localization(segmentation) in an unsupervised learning by adapting transformer network. Tools used: Python, Pytorch, research skills
Real-Time iron bar counter (See my webpage above)	Novel project for client Danieli Automation. Project developed from research idea till implementation, for automatic iron bar counter at the iron test bed. Tools used: Python, C++, ONNX, AI, Object detection, tracking, Object identification, segmentation, OpenCV
Real Time Person distance tracking for Covid safety (See GitHub above)	Welfare research project Turned a simple person detection AI model for real-time distance measurement during the initial days of Covid. The code and idea have later been used my many in Italy and abroad to deploy this in their premises or for conferences. Tools used: Python, object detection, transfer learning, tracking, DLib, OpenCV

Certification and Licenses

Data Science: R Basics (HarvardX: PH125.1x) - edX

bb7ef02f64574bebac62c4b1602d691d

Data Science with Data Camp - DataCamp

#4,575,621

DAT236x: Deep Learning Explained - Microsoft

611e36b954b24453b773dedba1cda56d

DEV210x: Introduction to C++ - Microsoft

847cc169f8394c17a0db8085a9ba42e0

Skills

Machine Learning/ Artificial Intelligence

- Neural networks/Deep learning, metric learning, neural trees, support vector machines, incremental learning, dimensionality reduction, optimization, few shot learning, Classical ML, Deep Anomaly Detection, decision tree, regression model, panoptic segmentation, SLAM etc.
- Environments/Tools: pytorch, keras, python, c/c++, anaconda, spyder, Weka, Rapid miner, OpenCV, ONNX, Tableau, pycharm, SQL and Non-SQL databases, Git, Docker, Linux

Computer Vision

- visual understanding/recognition/detection/tracking, feature learning, feature extraction, feature Matching, anomaly detection, anomaly localization, camera setting, optical flow, classical CV
- Environments/Tools: pytorch, python, c++, spyder, pycharm, matlab, visual studio

Data Analysis

- Statistical Data Analysis, Baysian Analysis, Data cleaning, data normalization, data transformation, data visualization, predictive analytics
- Environment/Tools: R, Python, MS-Excel, Tableau, WEKA, SciKit, numpy, pandas

Honors, Awards and Grants

Ph.D. Grant by External Institution (beanTech srl), 2018 – Grant covers the Ph.D. scholarship and all research cost during the period of my PhD research.

Research Grant from Italian Ministry of defense (171/2016**), 2018 –** Grant covers the cost of research for developing AI solutions for complex classification task for highly skewed data.

Hackathon Uniud Winner, 2019 – Won Hackathon organized by university of Udine in June 2019 by providing deep learning solution to an industrial problem within 24 hrs.

Erasmus+ Grant – Erasmus grant covers all the expenses of dual master's degree in Italy and Poland.

Erasmus Social - Erasmus Student Network, Nov 2017, awarded for participating in the Social Erasmus programs organized by Erasmus Student Network, Poland.

Achievement of Merit - Feroze Gandhi Institute of Engineering and Technology, Sep 2010, Awarded for the best performance in academics in year 2009-2010.

edX Grant – Received grant from edX which covered 95% of the certification cost for 1) Basic in R – by Harvard University 2) Deep learning Explained and C++ by Microsoft

Work Experience

AXISCADES

Assistant Engineer Analyst (Subcontracted by Airbus India)– Jan 2015 – Sept 2016

Safran Engineering Services

R&D Stress Analysis Engineer - Dec 2013 - Jul 2014

Technology Training and Research Centre

Trainee (CAE+CAD) - Aug 2013 - Nov 2013

Member and Association

- IAPR – Italian Association of Pattern Recognition, Italian Chapter 2018 – till date
- Reviewer for Elsevier – Artificial Intelligence in Medicine
- Reviewer for International Journal of Neural Systems
- Reviewer for Springer – Artificial Intelligence Review Journal

Language

- English – Professional Fluency (almost native)
- Hindi /Bhojpuri – native
- Italian – B1
- Polish – A1

References

Prof. Gian Luca Foresti (Ph.D. supervisor)

Email: gianluca.foresti@uniud.it
Phone: +39 0432 558402

Prof. Claudio Piciarelli (Ph.D. co-supervisor)

Email: claudio.piciarelli@uniud.it
Phone: +39 0432 558481