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Milind Padalkar

Curriculum Vitae

Skilled professional with 16 years of hands-on experience in image processing, 13 years in computer vision and machine learning, and 7 years in deep learning, focused on leveraging these disciplines to solve industrial challenges and drive innovation.

Education

2011–2017 **Ph.D. in Information and Communication Technology**,
Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar, India,
CPI: 9.00/10
Thesis title: *Novel Techniques for Auto-inpainting in Heritage Reconstruction*
Supervisor: Dr. Manjunath V. Joshi

2008–2010 **M.Tech. in Computer Engineering**,
Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, India,
CGPA: 8.75/10
Thesis title: *Histogram Based Efficient Video Shot Detection Algorithms*
Supervisor: Dr. Mukesh A. Zaveri

2004–2008 **B.E. in Information Technology**,
Finolex Academy of Management and Technology (FAMT), Ratnagiri, University of Mumbai, India,
Aggregate Percentage: 61.67%
Project title: *Content Based Image Retrieval System*
Supervisor: Prof. Santosh V. Jadhav

Skills

Programming ■ C/C++[1,2], ■ Python[1,2], ■ Matlab[4].

Libraries ■ OpenCV[1,2], ■ Qt[2], ■ PyTorch[1,2], ■ Keras (with Tensorflow)[2], ■ CAFFE[3].

Misc. ■ Godot Game Engine[1].

Employment

Jan. 2019 – till date **Postdoctoral Researcher**, *Pattern Analysis and Computer Vision (PAVIS), Istituto Italiano di Tecnologia (IIT), Genova, Italy.*
***Supervisors**: Prof. Vittorio Murino (Jan. 2019 – Aug. 2019) & Dr. Alessio Del Bue (Aug. 2019 onwards)*,
■ Developed functional prototypes using cameras, LEDs and computer vision & deep learning-based algorithms for real-world use, enabling precise defect detection in various industrial environments (combustion chamber tiles, yarn production and bridges).
■ Communicated with industrial partners, addressed deployment issues and published findings at relevant venues (ICPR2020, ICIP2021, ANIDIS2022).
■ Explored real-time processing of video streams to enable the use of computer vision algorithms for display in VR headsets.
■ Provided intermittent guidance to a former PhD student, leading to their publications in ICIAP2022, ICCV2023 & ECCV2024.

[1]Current active usage.
[2]Actively used in short spans over the last 5 years.
[3]Actively used between 2017–2018; not since.
[4]Actively used until 2017; not as much since.

Mar. 2017 – Dec. 2018 **Senior Research Engineer**,
Vehant Technologies, NOIDA, India,
- Contributed mainly towards projects involving video analytics systems.
- Developed an effective license plate super-resolution model using a shallow convolutional neural network.
- Worked towards developing a robust vehicle color recognition system using traditional image processing methods.
- Supervised design engineers and interns on several projects, viz., • vehicle counting, • vehicle model recognition from underside images, • traffic-light phase recognition, • optical character recognition for number plate identification, • helmet detection, and • X-ray image denoising.
- Conducted technical interviews for image processing and computer vision-based roles.

Apr. 2016 – Jul. 2016 **Teaching Assistant**,
DA-IICT, Gandhinagar, India,
- Maintained the "University Student Project Management and Evaluation System" (USPMES) at DA-IICT.

Aug. 2011 – Mar. 2016 **Junior Research Fellow (JRF)**,
DA-IICT, Gandhinagar, India,
- Worked on the project: "Immersive Navigation for a Walk-through Application", a part of the *Indian Digital Heritage Project* funded by Department of Science and Technology (DST), Govt. of India.

Feb. 2011 – Jul. 2011 **Assistant Professor**,
Master of Computer Applications Department,
Sardar Patel Institute of Technology, Mumbai, India.

Jan. 2011 – Feb. 2011 **Lecturer**,
Department of Information Technology,
Sardar Patel Institute of Technology, Mumbai, India.

Publications

Book

[1] **M. G. Padalkar**, M. V. Joshi, and N. L. Khatri, *Digital Heritage Reconstruction Using Super-resolution and Inpainting*, B. A. Barsky, Ed. Synthesis Lectures on Visual Computing, Morgan & Claypool Publishers, Dec. 2016. DOI: 10.2200/S00740ED1V01Y201611VCP026.

Book Chapter

[1] **M. G. Padalkar** and M. V. Joshi, "Automatic detection and inpainting of defaced regions and cracks in heritage monuments," in *Digital Hampi: Preserving Indian Cultural Heritage*, A. Mallik, S. Chaudhury, V. Chandru, and S. Srinivasan, Eds. Springer Singapore, 2017. DOI: 10.1007/978-981-10-5738-0_14.

Journal

[1] **M. G. Padalkar** and M. V. Joshi, "Auto-inpainting heritage scenes: A complete framework for detecting and infilling cracks in images and videos with quantitative assessment," *Machine Vision and Applications*, vol. 26, no. 2-3, pp. 317–337, 2015. DOI: 10.1007/s00138-015-0661-6.

Conferences and Workshops

[1] A. Natali, **M. G. Padalkar**, V. Messina, W. Salvatore, P. Morerio, A. Del Bue, and C. Beltrán-González, "Artificial intelligence tools to predict the level of defectiveness of existing bridges," in *XIX ANIDIS Conference, Seismic Engineering in Italy*, Sep. 2022, pp. 2020–2027. DOI: https://doi.org/10.1016/j.prostr.2023.01.258.

[2] M. Zohaib, M. Taiana, **M. G. Padalkar**, and A. Del Bue, "3D key-points estimation from single-view RGB images," in *21st International Conference on Image Analysis and Processing (**ICIAP**)*, [**Oral**], May 2022.

[3] C. Beltrán-González, **M. G. Padalkar**, and A. Del Bue, "Enhancing machine learning pipelines on industrial applications," in *Workshop: AI for Industry, Second CINI National Conference on Artificial Intelligence (Ital-IA)*, Feb. 2022, p. 113. [Online]. Available: https://www.ital-ia2022.it/assets/zip/industria.zip.

[4] **M. G. Padalkar**, C. Beltrán-González, and A. Del Bue, "Multi-illumination fusion with crack enhancement using cycle-consistent losses," in *2021 IEEE International Conference on Image Processing (**ICIP**)*, Sep. 2021, pp. 2898–2902. DOI: 10.1109/ICIP42928.2021.9506013.

[5] **M. G. Padalkar**, C. Beltrán-González, M. Bustreo, A. Del Bue, and V. Murino, "A versatile crack inspection portable system based on classifier ensemble and controlled illumination," in *2020 25th International Conference on Pattern Recognition (**ICPR**)*, 2020, pp. 4009–4016. DOI: 10.1109/ICPR48806.2021.9412039.

[6] **M. G. Padalkar**, M. V. Joshi, and N. Khatri, "Simultaneous inpainting and super-resolution using self-learning," in *Proc. 26th British Machine Vision Conference (**BMVC**)*, Jan. 2015, pp. 105.1–105.12. DOI: 10.5244/C.29.105.

[7] **M. G. Padalkar**, M. V. Vora, M. V. Joshi, M. A. Zaveri, and M. S. Raval, "Identifying Vandalized Regions in Facial Images of Statues for Inpainting," in ***ICIAP 2013 Workshop** on Multimedia for Cultural Heritage*, Sep. 2013, pp. 208–217. DOI: 10.1007/978-3-642-41190-8_23.

[8] **M. G. Padalkar**, M. A. Zaveri, and M. V. Joshi, "SVD Based Automatic Detection of Target Regions for Image Inpainting," in *Computer Vision - **ACCV 2012 Workshops***, Nov. 2012, pp. 61–71. DOI: 10.1007/978-3-642-37484-5_6.

[9] **M. G. Padalkar**, M. V. Joshi, M. A. Zaveri, and C. M. Parmar, "Exemplar based Inpainting using Autoregressive Parameter Estimation," in *Proc. International Conference on Signal, Image and Video Processing **ICSIVP***, [**Oral**], Jan. 2012, pp. 154–160, ISBN: 978-93-81583-19-7.

[10] **M. G. Padalkar** and M. A. Zaveri, "Dissolve Detection Based Shot Identification Using Singular Value Decomposition," in *Proc. Fourth Asia International Conference on Mathematical/Analytical Modelling and Computer Simulation **AMS***, [**Oral**], May 2010, pp. 312–316. DOI: 10.1109/AMS.2010.69.

Services

Reviewer
• ECCV2024, • ICPR2024, • ICMI2024, • VISART VII 2024, • EUSIPCO2023, • ICMI2023, • EUSIPCO2022, • ICMI2022, • SUMAC2022, • VISART2022, • BMVC2021, • SUMAC2021, • PReMI2019, • MDPI Journals (Imaging, Applied Sciences, Sensors), Electronics), • ICES Journal of Marine Science, • Multimedia Tools and Applications, • IEEE Access, • IEEE Transactions on Image Processing, • SpringerNature Computer Science, • Imaging Science Journal, • ICAPR2015.

Organizing Committee Member
• 3rd ACCV Workshop on e-Heritage, held in conjunction with ACCV2014.
• ACM Distinguished Speaker talks by Prof. Brian A. Barsky, Feb. 2016

Awards

Sept. 2015 Awarded the *Xerox Research Centre India Travel Grant (₹ 1,25,000)* to attend the 26^{th} British Machine Vision Conference (BMVC2015) at Swansea, United Kingdom.

Competitive Exams

2007 **Graduate Aptitude Test in Engineering (GATE)**,
Discipline: Information Technology,
All India Rank: 46

References

Available upon request.