Milind Padalkar

Curriculum Vitae

Mura dello Zerbino 12,
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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

2004 **Higher Secondary Certificate (H.S.C.)**,
Maharashtra State Board, India,
Percentage: 80.50%

2002 **Secondary School Certificate (S.S.C.)**,
Maharashtra State Board, India,
Percentage: 85.86%

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].

Publishing • LaTeX, • MS Office, • LibreOffice.

Operating Systems ▪ Microsoft Windows, ▪ Linux.

[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.

Experience

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),
Summary: I've been deeply involved in collaborative projects with industrial partners, leading the development of automated visual inspection systems to detect defects like cracks in combustion chamber tiles and flaws in textile yarn. My role has been pivotal in innovating techniques that integrate computer vision and deep learning to automate processes such as tile area detection, crack identification, and multi-illumination image fusion. I've also played a key part in creating functional prototypes for real-world use, enabling precise defect detection in industrial environments. These efforts have resulted in publications at conferences like ICPR2020 and ICIP2021, showcasing the impact of our work. Currently, I'm focused on leveraging advanced deep learning methods to recognize various infrastructure elements from images acquired through several sources and detecting defects therein. Additionally, I intermittently provide guidance to a Ph.D. student, which has led to publications at prestigious venues like ICIAP2022 and ICCV2023.

Mar. 2017 – Dec. 2018
Senior Research Engineer,
Vehant Technologies, NOIDA, India,
Summary: Developed a novel technique for license plate super-resolution using convolutional neural networks. Worked on vehicle color recognition. Guided design engineers and interns on various projects including traffic-light phase recognition, vehicle counting, optical character recognition, image registration, vehicle model recognition using underside images, vehicle logo recognition, helmet detection, and object recognition in X-ray images.

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,
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,
MCA 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.

International Exposure

Papers Presented • ICIP2021 (virtual), • ICPR2020 (virtual), • XRCI Open 2016 (2 posters), • BMVC2015 (poster), • MM4CH2013 (virtual), • ICSIVP2012 (oral), • AMS2010 (oral).

Events Attended ▪ NCVPRIPG2017, ▪ ACM Distinguished Speaker talk by Prof. Brian A. Barsky (UC Berkeley), ▪ NCVPRIPG2013, ▪ ICVGIP2012, ▪ DVAP2012.

Services

Reviewer • EUSIPCO2023, • EUSIPCO2022, • SUMAC2022, • 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, • Imaging Science Journal, • ICAPR2015.

Organizing Committee Member 3rd ACCV Workshop on e-Heritage, held in conjunction with ACCV2014.

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

Extra Curricular Activities

2007–2008	General Secretary of the institute (FAMT)
2007–2008	Chief Coordinator of the Information Technology Students Association (FAMT)
2005–2007	Coordinator for Athletics – Annual Sports (FAMT)
1999–2007	Participated and won in various games like Athletics, Chess and Football at College, Division, State and National level events
2001–2002	Awarded as the *National Athlete of the Year* by school (Vidya Vikasini English High School, Vasai, India)

Hobbies

♪♩♫	Playing musical instruments like mouth-organ & guitar.
Blog	I also like to write articles in my blog: http://milindpadalkar.wordpress.com

References

Available upon request.