DEEPAK GHIMIRE, Ph.D. (Interactive CV)

Computer Vision & AI/ML Expert | Senior Engineer & Researcher | 10+ Years in Edge AI, Autonomous Systems, ADAS, Robotics | Real-Time Inference, Sensor Fusion & Model Optimization

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Experience: 15+ Years (10+ after PhD)

Senior Research Engineer

Korea Electronics Technology Institute (KETI)

Jul 2024 – Present | Jeonju, Korea

Lead computer vision and edge-AI R&D for robotics, agriculture, and safety systems.

Selected Projects

- **Fire & Smoke Detection**
  Developing RGB/thermal perception for firefighting vehicles, using YOLO-based detection and temporal verification to reduce false alarms.
- **Physical AI / Delta Robot Vision**
  Built oriented detection and tracking for conveyor pick-and-place; exploring visual-prompt methods to introduce new products without detector retraining.
- **Autonomous Tractor Guidance**
  Developing straight-line guidance and error analysis for paddy fields using GPS, IMU, and ZED 2i cameras.
- **Smart Assist Robot**
  Developing LiDAR/camera perception for obstacle detection and route guidance for large vehicles, including telehandlers.
- **Smart Vertical Farming**
  Developed RGB/hyperspectral crop monitoring with temperature sensing for early disease detection and crop health assessment.

Research Professor

Soongsil University

Jan 2022 – Jun 2024 | Seoul, Korea

- **Efficient Edge AI**: Developed one-shot structured pruning and dataset compression to improve model efficiency and resource use on edge devices.
- **Teaching**: Taught Computer Vision and Deep Learning.
- **Graduate Supervision**: Supervised graduate students on AI/ML research projects.
- **Research Development**: Contributed to research planning, funding proposals, and scholarly publications.

AI / Computer Vision Engineer (Freelance)

BeEmotion.ai (formerly NVISO.ai), Switzerland

Feb 2018 – Apr 2022 | Remote via Upwork Inc.

- **ARM Edge Benchmarking**: Benchmarked 9 inference engines for classification and face detection on Raspberry Pi 3B+/4B and NVIDIA Jetson Nano.
- **Deployment Analysis**: Profiled latency, accuracy, and RAM; evaluated OS/thread settings, ONNX–TVM deployment, AutoTVM tuning, and multi-core scaling.
- **Automotive Vision**: Evaluated facial emotion recognition models and contributed to in-car IMS, supporting driver attention/fatigue monitoring and occupant emotion/gesture analysis.

Education

Ph.D. in Computer Science & Engineering

Jeonbuk National University

Mar 2011 – Aug 2014 | Jeonju, Korea

- **Thesis:** *Recognition of Facial Expressions Based on Salient Texture and Geometric Features.*
- Degree Certificate | Transcript

M.Sc. in Computer Science & Engineering

Jeonbuk National University

Mar 2009 – Feb 2011 | Jeonju, Korea

- **Thesis:** *A Robust Face Detection Method Based on Skin Color and Edges.*
- Degree Certificate | Transcript

Technical Skills

- **Programming Languages**
  – C/C++ (High-performance systems)
  – Python (AI/ML, scripting)
  – Java (Application development)
  – MATLAB (Scientific computing)
- **Libraries and Frameworks**
  – PyTorch / TensorFlow (Deep learning)
  – TensorRT / OpenVINO (AI model optimization)
  – NCNN / TVM / Tengine / Paddle-Lite / MNN (Lightweight AI inference)
  – OpenCV / Dlib (Computer vision and machine learning)
  – Open3D / MMDetection3D / OpenPCDet (3D data processing and object detection)
  – ARMCL (Embedded ML acceleration)
  – VLFeat (Vision library for MATLAB/C)
- **Development Tools**
  – Qt (GUI applications)
  – Visual Studio (C++ development)
  – ROS1/ROS2 (Robotics middleware)
- **Edge Computing Platforms**
  – Raspberry Pi (Embedded systems)
  – NVIDIA Jetson Nano/Xavier/Orin (AI at the edge)
- **Foundation Models**
  Basic experience with large language models (LLMs), vision-language-action (VLA) models, and world models.
- **Model Deployment and MLOps**
  – ONNX Runtime, Docker, FastAPI
  – Git/GitHub, TensorBoard, W&B

Academic Services

- **Editorial Board**
  – Discover Artificial Intelligence, a Springer Nature journal.

Postdoctoral Researcher

Korea Electronics Technology Institute (KETI)

Jul 2014 – Feb 2020 — Seoul, Korea

- Providing **vision-based solutions** for various challenges faced by **government and private sector clients**, including demonstrating ideas for project development and funding acquisition.
- Developing and implementing **vision-based ADAS algorithms**, including driver state monitoring, forward collision warning, and lane departure warning, and deploying them into vehicle front-facing dash cam systems and Android phones. ***Demo:*** YouTube.
- Contributing to multiple research projects focused on pedestrian and vehicle detection for surveillance monitoring, bird's eye view-based 3D object detection (***Demo:*** YouTube), stereo vision-based depth estimation, and algorithm optimization.

Graduate Research Assistant

Jeonbuk National University

Mar 2009 – Aug 2014 — Jeonju, Korea

- Contributed to multiple projects during my M.Sc. and Ph.D. studies, focusing on vision-based technologies such as **face detection and recognition, facial emotion analysis**, driver state monitoring, cast shadow detection, color image enhancement, object detection, and tracking.

Example Projects

- **Illegal Crossing Detection at Traffic Intersections**
  Developed a real-time traffic monitoring system to detect illegal crossings by tracking pedestrians and vehicles at intersections.
  Publication: IWPR 2016, ***Demo:*** YouTube
- **Touchless User Interaction for Large Displays**
  Designed an IR camera-based system to detect fingertip positions and map them to display coordinates, enabling intuitive touchless interaction.
  Publication: Int. J. Contents 2010, ***Demo:*** YouTube

Visiting PhD Scholar

Simon Fraser University, School of Computing Science

Feb 2014 – Apr 2014 — Burnaby, BC, Canada

- Worked on facial expression analysis at the Vision and Media Lab, focusing on geometric facial feature extraction and tracking techniques.

Teaching Faculty

Lumbini Engineering College, Pokhara University

Aug 2007 – Nov 2008 — Butwal, Nepal

- Taught courses in Object-Oriented Programming in C++, Computer Graphics, Digital Signal Processing, and Image Processing, including practical classes involving coding projects and hands-on practices.
- Supervised final-year undergraduate student projects.

- **Guest Editor for Special Issues**
  – Scale Space and Variational Methods in Computer Vision, MDPI, *Applied Sciences* (2022–2023).
  – Artificial Intelligence and Computer Vision in Neurological Disorders, MDPI, *Diagnostics* (2025–2026).
- **Distinguished Peer Reviewer**
  – Conducted over 60 verified peer reviews for multiple journals.
- **Technical Program Committee Member**
  – IWPR, International Workshop on Pattern Recognition, Tokyo, Japan, 11–13 May 2016.
  – ICSIP, IEEE International Conference on Signal and Image Processing, Beijing, China, 13–15 Aug. 2016.
- **Book Technical Reviewer**
  – Learning OpenCV 5 Computer Vision with Python – Fourth Edition (Authors: Joseph Howse, Joe Minichino), Packt Publishing Ltd.

Other Achievements

- **Academic Scholarships**
  – Full scholarships for M.Sc. and Ph.D. studies under the **Brain Korea 21 Plus (BK21+)** initiative (2009–2014).
  – Tuition waiver for undergraduate program (2003–2007) awarded to the top-performing student.
- **Public Writing & Engagement**
  – Nepali-language opinion articles published in **Nepali news portals**, covering AI infrastructure, digital governance, and public policy. Selected writing.
- **Publication Citation Metrics**
  – Citation data as of **2026.11.02**.

Platform	Articles	h-index	Citations
Google Scholar	55	20	2074
ResearchGate	59	19	1833
Semantic Scholar	52	18	1431
Scopus	43	18	1407
Web of Science	37	12	791

Languages

Nepali (Native)
English (C1 - Advanced)
Korean (Fluent)
Hindi (Fluent)

Proficiency levels are self-assessed.

Selected Publications

ID	Year	Title	Authors	Venue	IF/Q
J1	2026	GeoBASP: Geography-Aware Structured Pruning for Landslide-Scar Segmentation in the Nepal Himalaya	**Ghimire**	*Electronics*	2.9/Q2
J2	2026	Public Enterprise Decline and the Industrial Replacement Gap in Nepal: Evidence from Product-Level Trade Data and Explainable Machine Learning	Dhakal, S. Ghimire, **D. Ghimire**, Kim	*Sustainability*	4.1/Q2

Selected Publications (continued)

ID	Year	Title	Authors	Venue	IF/Q
J3	2026	STV-FSANet: Track-Level Spatio-Temporal Verification for Fire and Smoke Alarm Validation in Video Surveillance	**Ghimire**, Kim, Jo, Lee, Jeong, Kim	*Sensors*	4.0/Q2
J4	2026	Vision-Based Strawberry Ripeness Grading for Harvest Decision Support in Smart Greenhouses	Lee, **Ghimire**, Cho, Seo, Jeong, Kim	*Agriculture*	4.5/Q1
C1	2026	One-Cycle Structured Pruning via Stability-Driven Subnetwork Search	**Ghimire**, Kil, Jeong, Park, Kim	*WACV 2026 (IEEE/CVF)*	-
J5	2026	CDAI and DAS28-CRP Agreement in Rheumatoid Arthritis: A Tertiary-Care Cross-Sectional Study With Exploratory Machine Learning	S. Ghimire, Paudyal, **D. Ghimire**, Sharma, BK, Samad, Hosen	*Scientific Reports* (accepted)	4.9/Q1
J6	2026	Precision Biomarker Identification in Gynecological Cancers Using Coexpression Networks and Attention-Based LSTM in Healthcare 4.0	Sarker, Ahammed, Hosen, Miah, Islam, **Ghimire**, Hwang, Hosen	*Diagnostics*	3.8/Q1
J7	2025	Temporal Trends and Machine Learning-Based Risk Prediction of Female Infertility: A Cross-Cohort Analysis Using NHANES Data (2015–2023)	Begum, **Ghimire**, Hosen	*Diagnostics*	3.8/Q1
J8	2025	FUSE-Net: Multi-Scale CNN for NIR Band Prediction from RGB Using GNDVI-Guided Green Channel Enhancement	Lee, **Ghimire**, Kim, Cho, Kim, Jeong	*Sensors*	4.0/Q2
J9	2025	Association of Polycystic Ovary Syndrome with Clinical, Physical, and Reproductive Factors: A Data-Driven Analysis	Begum, Hosen, **Ghimire**, Park	*Diagnostics*	3.8/Q1
J10	2025	Federated Explainable AI-Based Alzheimer's Disease Prediction With Multimodal Data	Jahan, Adib, Kaiser, Hosen, **Ghimire**, Park	*IEEE Access*	4.2/Q2
J11	2024	Exploring Deep Learning and Machine Learning Approaches for Brain Hemorrhage Detection	Ahmed, Esha, Rahman, Kaiser, Hosen, **Ghimire**, Park	*IEEE Access*	4.2/Q2
J12	2024	Exploring Machine Learning for Predicting Cerebral Stroke: A Study in Discovery	Mia, Khanam, Ovy, **Ghimire**, Park, Begum, Hosen	*Electronics*	2.9/Q2
J13	2023	Loss-Aware Automatic Selection of Structured Pruning Criteria for Deep Neural Network Acceleration	**Ghimire**, Lee, Kim	*Image and Vision Computing*	5.0/Q1
J14	2023	A Review on the Detection Techniques of Polycystic Ovary Syndrome Using Machine Learning	Ahmed, Rahman, Jahan, Kaiser, Hosen, **Ghimire**, Kim	*IEEE Access*	4.2/Q2
J15	2023	RNN-CNN Based Cancer Prediction Model for Gene Expression	Thakur, Batra, Malik, **Ghimire**, Kim, Hosen	*IEEE Access*	4.2/Q2
J16	2023	Healthcare Internet of Things (H-IoT): Current Trends, Future Prospects, Applications, Challenges, and Security Issues	Kumar, Kumar, Verma, **Ghimire**, Kim, Hosen	*Electronics*	2.9/Q2
J17	2022	Magnitude and Similarity Based Variable Rate Filter Pruning for Efficient Convolution Neural Networks	**Ghimire**, Kim	*Applied Sciences*	2.9/Q2
J18	2022	A Survey on Efficient Convolutional Neural Networks and Hardware Acceleration	**Ghimire**, Kil, Kim	*Electronics*	2.9/Q2
C2	2017	Facial Expression Recognition Using Local Region Specific Dense Optical Flow and LBP Features	**Ghimire**, Park, Kim	*ACIVS 2017 (LNCS, Springer)*	-
C3	2016	Object Tracking via Background Subtraction for Monitoring Illegal Activity in Crossroad	**Ghimire**, Jeong, Park, Lee	*IAPR PR 2016 (SPIE)*	-
J19	2016	Facial Expression Recognition Based on Local Region Specific Features and SVMs	**Ghimire**, Jeong, Lee, Park	*Multimedia Tools and Applications*	Q1 (SJR)
J20	2016	Recognition of Facial Expressions Based on Salient Geometric Features and Support Vector Machines	**Ghimire**, Lee, Li, Jeong	*Multimedia Tools and Applications*	Q1 (SJR)
C4	2015	Facial Expression Recognition Based on Region Specific Appearance and Geometric Features	**Ghimire**, Jeong, Yoon, Choi	*ICDIM 2015 (IEEE)*	-
J21	2015	Online Sequential Extreme Learning Machine-based Co-training for Moving Cast Shadow Detection	**Ghimire**, Lee	*Multimedia Tools and Applications*	Q1 (SJR)
C5	2014	A Local Technique for Contrast Preserving Medical Image Enhancement	Pant, **Ghimire**, Park, Lee	*SPIE Medical Imaging 2014*	-
J22	2013	Geometric Feature-Based Facial Expression Recognition in Image Sequences Using Multi-Class AdaBoost and Support Vector Machines	**Ghimire**, Lee	*Sensors*	4.0/Q2
C6	2013	Automatic Facial Expression Recognition Based on Features Extracted from Tracking of Landmarks	**Ghimire**, Lee	*ICGPI 2013 (SPIE)*	-
C7	2012	A Lighting Insensitive Face Detection Method on Color Images	**Ghimire**, Lee	*SCET 2012 (IEEE)*	-
C8	2011	Nonlinear Transfer Function-Based Image Detail Preserving Dynamic Range Compression for Color Image Enhancement	**Ghimire**, Lee	*PSIVT 2011 (LNCS, Springer)*	-
J23	2011	Nonlinear Transfer Function-Based Local Approach for Color Image Enhancement	**Ghimire**, Lee	*IEEE Trans. on Consumer Electronics*	9.9/Q1
C9	2010	Color Image Enhancement in HSV Space Using Nonlinear Transfer Function and Neighborhood Dependent Approach with Preserving Details	**Ghimire**, Lee	*PSIVT 2010 (IEEE)*	-

Note: C = Conference Proceeding; J = Journal Publication.