Prakash Dhungana

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Education

University of Kentucky   Expected Summer 2026
Ph.D. in Computer Engineering   *Lexington, Kentucky, USA*
- **Research Interests:** Machine Learning, Embedded Systems, TinyML, Embedded Software
- **Thesis:** Proposal Expected Fall 2024

Josip Juraj Strossmayer University of Osijek   July 2021
Masters in Automotive Computing and Communications   *Osijek, Osijek-Baranja, Croatia*
- **Coursework:** Machine Learning, Computer Vision, Embedded Systems, Automotive Software
- **Thesis:** Brightness and color equalization in images obtained by merging images from multiple cameras and implementing solution on a real ADAS development platform

Tribhuvan University   September 2016
Bachelor's in Mechanical Engineering   *Kirtipur, Kathmandu, Nepal*
- **Coursework:** Thermodynamics, Machine Design, Theory of Machine and Mechanisms, Fluid Dynamics
- **Thesis:** Performance Evaluation of Uniform and Non-uniform Pitched Archimedean Screw Turbine

Projects

RTKWS: Real-Time Keyword Spotting | *TinyML, Quantization, Real-time operation, Embedded systems*
- Proposed architecture for complete integer operation-based feature extraction and classification for KWS suitable for embedded systems.
- Implementation and validation of the proposed solution for real-time operation.

PCIe Backbone Communication | *Linux device driver, NTB, DMA, NTRDMA, QNX*
- Implemented PCIe protocol-based communication drivers in Linux for multi-host ECU communication.
- Imported linux device drivers for NTB and PCIe from Linux ecosystem to QNX RTOS for automotive applications.

3LSS Integration | *AUTOSAR, MotionWise OS, Functional Safety, MISRA C*
- 3LSS safety feature integration for the automotive board using Infineon Aurix and NVIDIA Xavier.
- BSW configuration, RTE generation, and configuring error handling reactions for 3LSS.

Brightness and Color Equalization | *Computer Vision, ADAS Development Board, Digital Signal Processors, Embedded Systems*
- Proposed alternative to color balance for color enhancement and validated with an implementation for creating panoramic images.
- Adapted gamma correction and basic linear transform for brightness and color enhancement for matching brightness and color profile before forming a panoramic image.
- Implemented and validated proposed methods for creating smoother panoramic images with uniform brightness and color profile on an ADAS development board.

Publications

- P. Dhungana and S. A. Salehi, "Exploring the Effect of Kernel Depth in Compact Keyword Spotting Models," 2024 International Congress on Human-Computer Interaction, Optimization and Robotic Applications (HORA), Istanbul, Turkiye, 2024, pp. 1-6, doi: 10.1109/HORA61326.2024.10550542.

- P. Dhungana and S. A. Salehi, "RTKWS: Real-Time Keyword Spotting Based on Integer Arithmetic for Edge Deployment," 2024 25th International Symposium on Quality Electronic Design (ISQED), San Francisco, CA, USA, 2024, pp. 1-7, doi: 10.1109/ISQED60706.2024.10528680.

- S. A. Salehi and P. Dhungana, "A Low-cost keyword spotting architecture based on wavelet packets feature extraction for edge device," 2024 25th International Symposium on Quality Electronic Design (ISQED), San Francisco, CA, USA, 2024, pp. 1-1, doi: 10.1109/ISQED60706.2024.10528719.

- P. Dhungana, M. Herceg, R. Grbić and V. Marinković, "Implementation of brightness and color equalization methods to create a smooth panoramic image on a real ADAS platform," 2022 International Symposium ELMAR, Zadar, Croatia, 2022, pp. 185-190, doi: 10.1109/ELMAR55880.2022.9899793.

Experience

University of Kentucky   January 2023 – Present
Graduate Student Assistant   *Lexington, Kentucky, USA*
- Assisted in conducting laboratory exercises for the courses Introduction to Embedded Systems and Advanced Embedded Systems.
- Assisted in guiding final year Electrical and Computer Engineering students for final year capstone projects.
- Deploying machine learning systems on resource-constrained embedded systems.
- Enabling on-device training, inference and adaptation of efficient and robust ML solutions.

TTTech Auto   July 2021 – December 2022
Embedded Software Developer   *Osijek, Osijek-Baranja, Croatia*
- Integration of NVIDIA three layered safety services (3LSS) framework in multi-host automotive ECU platform.
- PCIe high-speed communication backbone for multi-host automotive ECU.

Goldfish International   March 2018 – August 2019
Service Advisor   *Gurjudhara, Kathmandu, Nepal*
- Managed central workshop and oversaw a nationwide service chain network efficiently.
- Administered overhauling of internal combustion engine, transmission gearbox and differentials.

IME Motors Pvt. Ltd.   December 2016 – February 2018
Service Advisor   *Bharatpur, Chitawan, Nepal*
- Managed repair timelines, diligently tracked justifications for on-hold repairs, and optimized response times for efficient service delivery.
- Facilitated and coordinated warranty settlements with manufacturers and other equipment manufacturer(OEM) component.

Awards

- **Outstanding Graduate Student** awarded by FERIT, University of Osijek, July 2022.

- **Graduate Student Travel Grant** awarded by Department of Electrical and Computer Engineering, University of Kentucky, Spring 2024.

- **Conference Award** awarded by Graduate Student Congress, University of Kentucky, Summer 2024.

Technical Skills

Languages: Assembly, C, C++, C#, Python
Frameworks: TensorFlow, OpenCV, Video for Linux
Software Development: Agile, Scrum
Tools: Jira, Git, Bitbucket, AUTOSAR DaVinci, MATLAB, Visual Studio, GNU Make
Standards: ISO 26262, MISRA C, ASPICE
Embedded Systems: Arduino, STMicroelectronics, Texas Instruments, Espressif Systems, Raspberry Pi
Automotive Development Boards: Infineon Aurix, Nvidia Xavier, Texas Instruments TDA2x
Automotive Debugger: QNX Momentics, TRACE
Key Concepts: Real-Time Operating System, Artificial Intelligence, Machine Learning, Neural Networks, Edge Computing, Functional Safety, AUTOSAR, QNX, DriveOS

Course Certifications and Trainings

Automotive Software with AUTOSAR: TTTech Auto 2022
Automotive Software with MotioWise: TTTech Auto 2022
Learn Linux Kernel Programming: Udemy 2022
Linux Device Drivers: Udemy 2022
The Complete Self-Driving Car Course – Applied Deep Learning : Udemy 2022