SUDARSHAN DEVKOTA

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EXPERIENCE

Member of Technical Staff - Software Development Engineer Mar 2024 - Present
AMD, Orlando, FL

- Develop and optimize the Vulkan driver for AMD GPUs, enhancing performance and compatibility across various platforms
- Collaborate with cross-functional teams to design and implement new features ensuring integration with existing system
- Assist in drafting sections of the Vulkan specification for AMD extensions.
- Participate in code reviews and provide constructive feedback to peers, fostering a collaborative and high-performing development environment

Graduate Teaching Associate - Lecturer for Computer Graphics Aug 2023 - Dec 2023
University of Central Florida, Orlando, FL

- Delivered lectures twice a week on fundamentals of computer graphics with OpenGL
- Developed curriculum and teaching material for a class of 110 students
- Offered personalized guidance and mentoring to students
- Administered and assessed exams, programming assignments, and projects.

Graduate Teaching Assistant Aug 2018 - July 2023
University of Central Florida, Orlando, FL

- Facilitated courses including Introduction to Discrete Structures, Security in Computing, Introduction to C programming, Advanced Computer Architecture, and Computer Graphics

Co-op Engineer for Vulkan May 2021 - Aug 2021
AMD, Orlando, FL

- Three consecutive internships at AMD: Summer 2019, 2020, and 2021
- Maintain and refine Vulkan driver architecture.
- Validate functionality for existing and new features in the driver code.
- Perform prototyping of functionalities for upcoming features.
- Develop internal tools to improve development efficiency and productivity.

Researcher and Developer Jan 2017 - Apr 2018
Spark Technology Pvt. Ltd., Kathmandu, Nepal

- Implement theories, algorithms, and mathematical models to research related projects.
- Implement and optimize Deep Neural Network models for machine learning projects.
- Develop technical documentation.

PUBLICATIONS

Efficient neural representation of volumetric data using coordinate-based networks

- S. Devkota and S. Pattanaik. Efficient neural representation of volumetric data using coordinate-based networks. *Computer Graphics Forum*, 2023

Deep learning based super-resolution for medical volume visualization with direct volume rendering

- S. Devkota and S. Pattanaik. Deep learning based super-resolution for medical volume visualization with direct volume rendering. In *Advances in Visual Computing*, pages 103–114, Cham, 2022. Springer International Publishing

Referenced based color transfer for medical volume rendering

- S. Devkota and S. Pattanaik. Referenced based color transfer for medical volume rendering. In *Advances in Visual Computing*, pages 197–208, Cham, 2020. Springer International Publishing

PROJECTS

Single Shot Detector for Face Detection Nov 2018 - Dec 2019

- Abstract: Single shot detection (SSD) architecture with Inception V2 as base model is implemented to detect faces in an image. Furthermore, features from these faces are extracted using a different neural network architecture called FaceNet to facilitate for face recognition

SVBRDF Extraction using a Deep Auto-Encoder Nov 2018 - Dec 2019

- Abstract: A deep Auto-Encoder architecture called U-Net is used to extract the SVBRDF of a surface from a single image. The SVBRDF is estimated using four parameterized maps which are per-pixel normal, specular roughness, specular albedo, and diffuse albedo

A Neural Network Approach for Prediction of DNA Protein Binding Mar 2019 - Apr 2019

- Abstract: Different neural network architectures are implemented, and their performances are evaluated for the classification of DNA sequences based on whether transcription factors bind to the given DNA sequence.

Deep Learning for Ransomware Detection Mar 2019 - Apr 2019

- Abstract: A deep learning based method which utilizes static analyses on the captured ransomware packets to distinguish between ransomwares and normal user activity

Simulation of Solar System Oct 2018 - Nov 2018

- Abstract: As the name implies, it is a basic simulation of the solar system which was programmed in Python with OpenGL as the graphics library.

Real-time Audio Content Recognition Engine (RARE) Jun 2017 - Apr 2018

- Abstract: RARE is an audio-signal processing engine capable of identifying audio content in any feed (TV, radio, online streams).

Biometric Fingerprint Based Centralized Attendance System Apr 2017 - Jul 2017

- Abstract: Fingerprint images from fingerprint device sensors at different locations are sent to a centralized server for matching, identification, and registering attendance for an individual.

Fingerprint Classification Using Deep Neural Network Feb 2017 - Jun 2017

- Abstract: Implemented Transfer Learning for the classification of biometric fingerprints. The final layer of the inception model was re-trained using NIST SD4 dataset and fingerprint images collected from different sources.

Sentiment Analysis Using Recurrent Neural Network Feb 2017 - Mar 2017

- Abstract: A Recurrent Neural Network classifies a given sentence into either a positive or a negative sentiment.

Nepali Number Recognition Using Convolutional Neural Network Dec 2016 - Feb 2017

- Abstract: A Convolutional Neural Network classifies a given image containing a Nepali numerical digit into either one of the ten Nepali numbers.

Vehicle Detection and Road Traffic Congestion Mapping Using Image Processing Dec 2015 - Aug 2016

- Abstract: Vehicle tracking was performed with non-maxima suppression followed by histogram matching. Furthermore, Dijkstra's algorithm was implemented to find the shortest route among a list of alternative routes to avoid vehicle congestion.

Graphical Password Authentication Using Persuasive Cued Click Points for file encryption. May 2015 - Aug 2015

- Abstract: Implemented AES encryption to provide security to the files and SHA-256 as the hashing technique to generate a fixed-length key for the cipher.

4S-Roadies, A Game Application Nov 2013 - Jan 2014

- Abstract: 4S Roadies is a 2D, top view, racing game, windows application.

EDUCATION

Ph.D Computer Science Aug 2018 - Dec 2023
University of Central Florida, Orlando FL
Final dissertation on "Deep Learning Approaches for Automatic Colorization, Super-resolution, and Representation of Volumetric Data"

B.E. Electronics and Communication Nov 2012 - Nov 2016
Tribhuvan University, Institute of Engineering, Kathmandu, Nepal
Final dissertation on "Vehicle Detection and Road Traffic Congestion Mapping Using Image Processing"

SKILLS

- **Programming Languages: C, C++, Python**, C#, Java, JavaScript, (Assembly languages: 8085, 8086, 8051)
- **Frameworks and APIs: WebGL**, **OpenGL**, **Vulkan**, **GLSL**, TensorFlow, Keras, **PyTorch, Qt, tkinter**, CUDA, Hadoop, Django, Flask, Vue JS
- **Game engines:** Unity
- **Version Control:** Github, Gitlab, Perforce
- **Database:** MySQL, MongoDB, PostgreSQL, Redis, Apache Solr
- **Cloud technologies:** Google Cloud Platform
- **Continuous Integration:** TeamCity, Jenkins
- Neural rendering, 3D rendering, Super-resolution, Deep learning, Volume visualization, Ray tracing

CERTIFICATIONS

- **Deep Learning Specialization (deeplearning.ai)** by Professor Andrew Ng — Oct 2017 - Dec 2017
- **Machine Learning (coursera)** by Professor Andrew Ng, Stanford University — Jun 2017 – Aug 2017
- **M101P MongoDB** by Professor Andrew Erlichson, MongoDB University — May 2017 – Jul 2017