Birendra Kathariya

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Summary

I am seeking a fulltime position with a company where I can use my talents and skills to benefit the company while I experience advancement opportunities.

Education

B.E. | AUGUST 2008- NOVEMBER 2012 | NEPAL ENGINEERING COLLEGE, NEPAL

- Major: *Electronics and Communication Engineering*, GPA: *3.91/4.00*

MASTERS | AUGUST 2015-JULY 2017 | UNIVERSITY OF MISSOURI-KANSAS CITY, MISSOURI, USA

- Major: *Electrical and Computer Engineering*, GPA:*4.0/4.0*

PHD | AUGUST 2017-PRESENT | UNIVERSITY OF MISSOURI-KANSAS CITY, MISSOURI, USA

- Major: *Electrical and Computer Engineering*, Minor: *Mathematics*

Skills & Abilities

PROGRAMMING

- C, C++, Python, Matlab, VHDL

EXPERTISE

- Image, Video and Point Cloud Compression/Processing
- Compression in Federated Learning and Deep Learning Model Compression
- Machine Learning, Neural Network and Deep Learning

Experience

RESEARCH ASSISTANT | MCC LAB, UMKC | AUGUST 2016-PRESENT

- The key responsibilities are to conduct research on different topics related to *multimedia computation and compression* under the supervision of Professor Zhu Li.

INTERNSHIP | MEDIATEK, SAN JOSE, CA | JUNE 2017- JULY 2017

- Implement tiled based 360^{o} video player on web-browser that should support MPEG-DASH (Dynamic Adaptive Streaming over HTTP) SRD (Spatial Relationship Descriptor)

INTERNSHIP | FUTUREWEI TECH. INC., SAN JOSE, CA | JUNE 2018- DEC 2018

- Made a contribution to G-PCC (Geometry Based Point Could Compression), a point cloud compression standard developed by MPEG-PCC for static and LiDAR dataset. The contribution "*Binary-tree based level-of-details generation for attributes coding in G-PCC*" got adopted in the tmc13v5 standard.

INTERNSHIP | TENCENT AMERICA, PALO ALTO, CA | MAY 2019- AUGUST 2019

- Worked on inter-version of G-PCC (Inter-EM) which is an exploratory model for point cloud compression for frame-based point cloud. The idea was to exploit both geometry as well as the attribute values to search the matching block in the reference frame.

INTERNSHIP | QUALCOMM, SAN DIEGO, CA | AUGUST 2021- JANUARY 2022

- Worked on Learning-based In-loop filter for VVC (Versatile Video Coding). Utilized CNN and Transformers to design learned In-loop filter.

INTERNSHIP | QUALCOMM, SAN DIEGO, CA | AUGUST 2022- SEPTEMBER 2023

- Worked on deriving the angular parameters of KITTI dataset for optimal compression with G-PCC.

Publication

- ***Birendra Kathariya**, Zhu Li, G. Van der Auwera, "TSF-Net3D: TSF-Net for 3D Point Cloud Attribute Compression Artifacts Removal ", ICIP 2024 (Submitted)*
- ***Birendra Kathariya**, Anique Akthar, Zhu Li, G. Van der Auwera, "PointCU: Multiscale Sparse Convolution Learning for Point Cloud Color Upsampling", TCSVT 2023 (Under Review)*
- ***Birendra Kathariya**, Zhu Li, G. Van der Auwera, "Joint Pixel and Frequency Feature Learning and Fusion via Channel-wise Transformer for High-Efficiency Learned In-Loop Filter in VVC", TCSVT 2023*
- ***Birendra Kathariya**, Zhu Li, Hongtao Wang, Mohammad Coban, "Multi-stage Spatial and Frequency Feature Fusion using Transformer for CNN-Based In-loop Filter for VVC", PCS 2022*
- ***Birendra Kathariya**, Zhu Li, Hongtao Wang, Geert Van Der Anuwera, "Multi-stage Locally and Long-range correlated Feature Fusion for Learned In-loop Filter for VVC", VCIP 2022*
- ***Birendra Kathariya**, Zhu Li, Jianle Chen, Geert Van Der Anuwera*, "Gradient Compression with Variational Coding Scheme for Federated Learning", VCIP, December 2021
- ***Birendra Kathariya**, Li Li, Zhu Li, Lingyu Duan and Shan Liu,* "Network Update Compression for Federated Learning", VCIP, December 2020
- *Anique Akhtar, **Birendra Kathariya**, Zhu Li, "Low Latency Scalable Point Cloud Communication", ICIP, September, 2019*
- ***Birendra Kathariya**, Vladyslav Zakharchenko, Zhu Li, and Jianle Chen,* "Level-of-detail generation using binary-tree for lifting scheme in point cloud attributes coding", DCC, March 2019
- ***Birendra Kathariya**, Li Li, Zhu Li, Jose R. Alvarez, Jianle Chen,* "Scalable Point Cloud Geometry Coding with Binary Tree Embedded Quadtree", ICME, July 2018
- ***Birendra Kathariya**, Li Li, Zhu Li, Jose R. Alvarez,* "Lossless Dynamic Point Cloud Geometry Compression with Inter Compensation and Travelling Salesman Prediction", DCC, March 2018
- ***Birendra Kathariya**, Ainala Karthik, Zhu Li, Rajan Joshi,* "Embedded binary tree for dynamic point cloud geometry compression", VCIP, December 2017
- *Karthik Ainala, Rufael N. Mekuria, **Birendra Kathariya**, Zhu Li, Te-Kui Wang, Rajan Joshi*, "An improved enhancement layer for octree based point cloud compression with plane projection approximation", SPIE September 2016

Patents

- **B. Kathariya,** S. Yea, A. Vosoughi, S. Liu, "Method and apparatus for adaptive point cloud attribute coding", (Work done during Internship at Tencent)
- V. Zakharchenko**, B. Kathariya**, J. Chen, "Hybrid Geometric Coding of Point Clouds" (Work done during Internship at FutureWei Tec. Inc.)