

# Raman Ghimire

Seoul, South Korea

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## Summary

**Field Of Expertise:** Image Classification, Object Detection, Semantic & Instance Segmentation, Generative Adversarial Networks (GAN), Diffusion Models, Facial LandMark Detection, Pose Estimation, 3D Point Cloud Analysis

**Libraries:** Pytorch, Keras, Tensorflow, Scikit-Learn, Opencv, Numpy, Pandas, Nibabel, Matplotlib

**Programming Languages:** Python, C++

**Languages:** Nepali(native), English(fluent), Hindi(fluent)

**others:** Docker, Git, Gradio, Slack, Latex, Pycharm, Jupyter Notebook, Microsoft Office, Ubuntu, Windows

## Work Experience

### Cybermed Inc.

Geumcheon, Seoul

AI RESEARCHER

Apr. 2022 - Present

- Developed and implemented deep learning models for segmentation and detection of dental caries and root inflammation from 2D panoramic images.
- Developed GAN-based models capable of accurately reconstructing missing dental structures on 2D projected 3D data, aiding in comprehensive treatment planning.
- Conducted research on semantic and instance segmentation of teeth structures using state-of-the-art (SOTA) models with Cone Beam Computed Tomography (CBCT) data.
- Benchmarked the performance of our developed models and algorithms against the latest advancements in the field, ensuring their efficacy and updating as needed.
- Extended the scope of research to 3D dental image analysis, specifically focusing on semantic segmentation to categorize dental structures and instance segmentation for individual tooth separation.
- Implemented facial landmark detection algorithms to support orthodontic treatment planning, smile design, and facial soft tissue analysis.
- Engaged in research on 3D point cloud analysis to address the completion of missing teeth in dental models.

### Gachon Universtiy

Seongnam, Gyeonggi-do

RESEARCH ASSISTANT (PRML LAB)

Aug. 2019 - Feb. 2022

- Conducted research on medical image segmentation using networks such as UNet, its variants, and transformer-fused CNNs.
- Researched classification networks including EfficientNet, ResNet, and MobileNet.
- Implemented state-of-the-art architectures on various computer vision and deep learning systems.

## Projects

### Colonoscopy Analysis

Master's Project

- Conducted colon cancer cell segmentation using encoder-decoder architectures like U-Net and U-Net++, as well as hybrid CNN-Transformer networks.
- Conducted research on generalization of medical images with the usage of GAN.
- Conducted colorectal disease classification using distance-based metric learning losses such as Triplet Loss, Proxy-NCA loss, Proxy-Anchor loss, and Soft-Triple Loss.

### Bio-Particle Analysis

Master's Project

- Collected data on various airborne substances using a mediaeaver bio-particle sensor.
- Developed machine learning algorithms for determining air quality and automatically assessing the level of bio-particles in the surrounding environment.

## Education

### Gachon University

Gyeonggi-do, S.Korea

M.S IN SOFTWARE STUDIES

Aug. 2019 - Feb.2022

Thesis: Enhanced Feature Selection with Transformer for Precise Polyp Segmentation

### Tribhuwan University

Kathmandu, Nepal

B.S. IN ELECTRICAL ENGINEERING

Jun. 2013 - Aug. 2017

## Publications

### MMNet: A Mixing Module Network for Polyp Segmentation

RAMAN GHIMIRE, SANG-WOONG LEE

Aug 2023

Sensors

## **Polyp Segmentation with Consistency Training and Continuous Update of Pseudo-Label**

HYUN-CHEOL PARK, SAHADEV POUDEL, RAMAN GHIMIRE, SANG-WOONG LEE

Aug 2022

*Scientific Reports*

## **Transformer-based Network for Automatic Polyp Segmentation**

RAMAN GHIMIRE, SAHADEV POUDEL, SANG-WOONG LEE

Gwangju, S. Korea

*Proceedings of 2021 KING Summer Conference*

May 2021

## **An Augmentation Strategy with Lightweight Network for Polyp Segmentation**

RAMAN GHIMIRE, SAHADEV POUDEL, SANG-WOONG LEE

Nice, France

*Proceedings of the 3rd International Workshop and Challenge on Computer Vision in Endoscopy (EndoCV 2021)*

April 2021

## **References**

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### **Sang-Woong Lee**

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SUPERVISED DURING MY MASTER'S STUDIES AT GACHON UNIVERSITY, GYEONGGI-DO, SOUTH KOREA.