Kamlesh Rana Bhat

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OBJECTIVE

Aspiring Computer Science professional specializing in medical image analysis, prognostic predictive models, and radiomics. Proficient in medical image processing with a solid foundation in developing AI-driven solutions for Medical diagnosis. Seeking opportunities to apply my skills in a dynamic environment, contributing to AI for medical innovations.

EDUCATION

Bachelor of Engineering (B.E) - Computer Engineering 2019 – 2024
Institute of Engineering, Tribuvan University
Kathmandu, Nepal

SKILLS

EPT: Overall 7.5 [Reading:9.0, Writing:8.0, Listening:7.0, Speaking:6.5]

Languages: Python, C++

Libraries: PyTorch, MONAI, TensorFlow, NumPy, Scikit-learn, Pandas, Open-CV, Flask, Seaborn

Machine learning: Feature Engineering, Optimization, Modeling, EDA, Contrastive Learning, Medical Image Processing, Deep Learning, AWS

Tools: Git, Excel, VS Code, Jupyter Notebook, Conda, Microsoft Office, Heroku

Soft Skills: Problem-Solving, Communication, Mass Presentation, Leadership, Team Collaboration, Creativity

RESEARCH EXPERIENCE

Research Assistant 2024 - Present
NepAl Applied Mathematics and Informatics Institute for Research (NAAMII)

- Medical image synthesis
- Spatial segmentation of tumor and it's localization
- Medical Image Processing

Undergraduate Research Student 2023 - 2024
Pashchimanchal Campus, Tribhuvan University

- Research on Medical Diagnosis using AI in collaboration with 4 different hospitals in Nepal
- Data-collection and surveys with patients at hospital (437 patients)
- Collaborate and coordinate with faculty, doctors, health workers and medical staffs for data validation
- Conference Presentation at Gandaki University International Conference-January 3-5, 2024

TEACHING EXPERIENCE

Part-time Teaching Assistant 2024 - Present
Pashchimanchal Campus, Tribhuvan University

- Big Data Technologies
- Image Processing and Pattern Recognition
- Signals and Transforms

PAPER AND PUBLICATIONS

- **K. Rana Bhat**, I. P. Paneru, I. Sharma, K. Pathak, and N. Lamichhane. *Early Stage Diagnosis of Diabetic Retinopathy using Nested U-Net Architecture*. Under revision at *Computers in Biology and Medicine*.

- **K. Rana Bhat**, U. R. Dhungana. *A Novel Contrastive Learning Framework for Classification of Malignant and Benign Tumor*. (Manuscript ready for publication).

PROJECTS

Anatomical Segmentation in CT images

- Studied different medical image segmentation algorithms
- Trained model for efficient segmentation of anatomy
- Optimized model for better Dice scores (achieved 0.97)

Synthetic Medical Imaging using GAN.

- Deployed GAN model for medical image synthesis
- Fine tuned the model for realistic and sensitive image generation
- Diffusion model for label inpainting to generate segmentation labels

Variants Generation for image patterns.

- Transformer network for image generation
- Fine tuned stable diffusion model for variant generation

Early Stage Diagnosis of Diabetic Retinopathy Using Deep Learning.

- Image processing of "Fundus" images (CLAHE enhancement and Detail Preservation)
- Blood vessel segmentation for RoI extraction using Nested U-Net architecture L4 with mean Intersection over Union (IoU) of 0.73 and a loss of -0.52
- Stage classification of DR using RoI extracted with an accuracy of 95.41%
- Dataset used: APTOS database

Non-Invasive Detection and Stage Classification of Anemia in Pregnant Women in Nepal Using Image of Conjunctiva of the Eye.

- Data collection with coordination with 4 different hospitals of Nepal from 437 different patients
- Data labeling and Image processing
- RoI extraction i.e Conjunctiva of the eye using U-Net architecture
- Stage classification of Anemia using extracted conjunctiva of the eye with an accuracy of 81.30%
- Model validation with real patients using mobile application

AWARDS AND ACHIEVEMENTS

- **University Grant Commission – Mini-Research Grant (2024)**
  Awarded for the project **'Contrastive Learning Framework for multi-label pancreatic tumor segmentation.'**
- **University Grant Commission – Mini-Research Grant (2023)**
  Awarded for the project **'Anemia Detection in Pregnant Women in Nepal Using Deep Learning'**
- **OpenStreetMap(OSM) Hackfest, Runner Up (2023)**
  Awarded for the Best **Tours and Travels Managaement WebApp** with AI integrated recommendation system.

REFERENCES

Taman Upadhaya, PhD
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