

(Foundations of) Machine Learning

MSc Information System Engineering
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Table of Contents

Course Organization

- detailed/edited syllabus
- Theory + Practicals
- *deeplearningbook.org* + draft course notes
- Project *grand-challenge.org/challenges/*
- Course repo *<https://github.com/msrepo/ml-mscise-2023>*

About NAAMII(@naamiinepal)

- open science
- applied research
- Education outreach

Current Research

Detailed Syllabus

15 Weeks, 3hrs/Week Lecture, Class load 4-6 hrs / Week

1. ML foundations (Regression, Classification) 4 Weeks
2. Deep Networks 4 Weeks
3. Convolutional Neural Network 3 Week
4. Project 2 Week
5. Practicals / Source code walkthrough 2 Week

Project Work

2Week, 14 hrs

- focus on understanding the problem, not just chasing accuracy
- Managing ML Experiments, Code Organization, reproducible

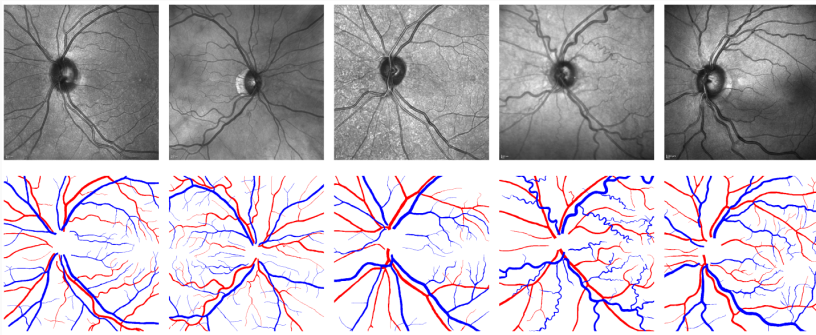


Figure 1: Retinal arteries and veins segmentation on Infrared Reflectance Imaging(From RAVIR Challenge)

open science

- https://github.com/naamiinepal/colorimetric_analysis_final
Machine-Learning-Assisted Analysis of Colorimetric Assays on Paper Analytical Devices, B. Khanal et. al 2021
- <https://github.com/naamiinepal/covid-tweet-classification> COVID-19-related Nepali Tweets Classification in a Low Resource Setting
- <https://github.com/naamiinepal/IPV-detection> Detecting Online Intimate Partner Violence using AI

Education Outreach

- First Nepal Winter School in AI, 2018
- www.youtube.com/playlist?list=PLAT0T4xBwLf87BFUzpyXIzI3NkyEe78v2
Third Nepal Winter School in AI, 2021

Current Work @ NAAMII

Implant Identification

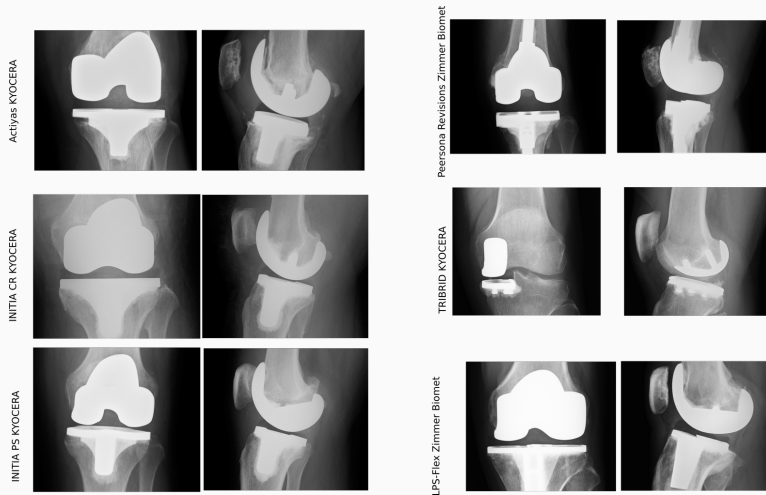


Figure 2. Find the manufacturer and model of the implant.

Current Work @ NAAMII

Implant Identification

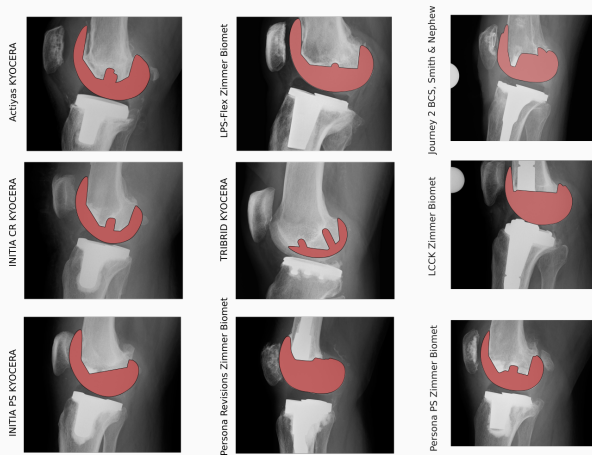
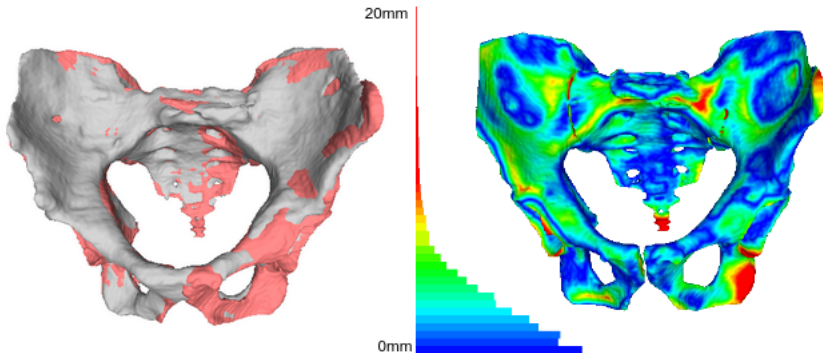
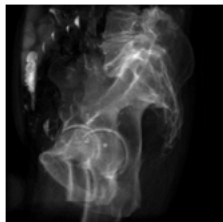


Figure 3: Find the manufacturer and model of the implant

Current Work @ NAAMII

Biplanar X-ray to 3D Reconstruction



Avg. surface error **2.68 mm**

Red: Ground truth

Gray: Predicted

Questions?