A Introduction:

Which dataset:

Skin Cancer malignant vs benign images <https://www.kaggle.com/datasets/fanconic/skin-cancer-malignant-vs-benign>

Why dataset:

Straightforward and easy to understand, small so workable within our infrastructure

Real applications with this dataset so good practice for doing propper research at a later date after we learn the technology

Clear path for applying techniques that we know, and can transfer that to applying things we have to research ourselves

Final goals:

Learn how to apply all the things we’ve learned about in class to an actual real world data

Use working dataset to discover different AI methods on our own

B Dataset Introduction:

Data intro:

The data is a set of images of moles on skin separated into two categories, ones that are malignant to skin cancer, the other benign.

The preprocessing is labeling the data for training models.

C Literature Review:

This article has used a reinforcement learning model to increase accuracy of known supervised learning models to detect skin cancer on a similar set of images that contain pictures of skin. Their study reduced overconfidence while maintaining accurate marker sensitivities [1].

D Existing Methods to be used:

Model: decision tree, resnet 50 pre trained classification

Evaluation: Iou/precision/recall

Uncertainty: data Entropy

E Experiment/Simulation plans:

Classify the images and separate into train and test groups. The RGB pixels of the images will act as the attributes for training. Then train both models on the labeled set. Do Iou precision recall calculations for both models against test groups.

F reference:

Barata, C., Rotemberg, V., Codella, N.C.F. *et al.* A reinforcement learning model for AI-based decision support in skin cancer. *Nat Med* 29, 1941–1946 (2023). <https://doi.org/10.1038/s41591-023-02475-5>

Entropy uncertainty

<https://towardsdatascience.com/entropy-is-a-measure-of-uncertainty-e2c000301c2c>

Kwiatkowski, S. (2018, October 6). *Entropy is a measure of uncertainty*. Medium. <https://towardsdatascience.com/entropy-is-a-measure-of-uncertainty-e2c000301c2c>