# Proficiency is Associated with Higher Idiosyncratic Biases in Medical Image Perception

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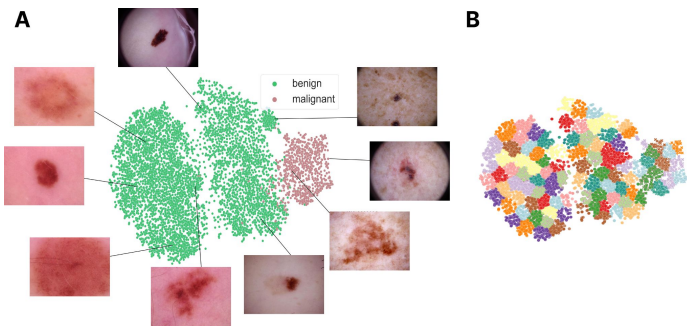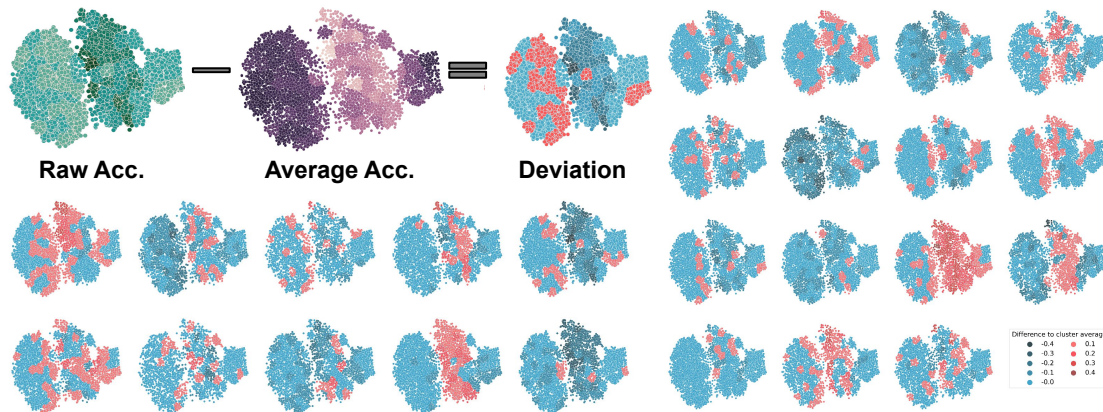
Idiosyncratic Biases in Diagnosis

Dr. A — **Benign** / **Malignant** — Dr. B

Malignant / **Malignant**
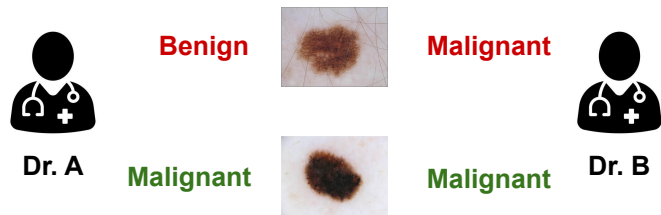
Skin Cancer Images and Semantic Clusters

- **7,818 images from ISIC 2019 Challenge Dataset**
- **758,139 diagnoses from 1,173 participants**
- **Clusters formed via feature vectors of a Deep Learning Model**

A

B

benign
malignant

Diagnostic Responses

Raw Acc. — Average Acc. = Deviation

Difference to cluster average
-0.4 0.1
-0.3 0.2
-0.2 0.3
-0.1 0.4
-0.0

Proficiency v.s Idiosyncratic Biases

A — Pearson's R coefficient — High performance / Low performance — **All 100 clusters**

B — Pearson's R coefficient — Within-subject / Between-subject — High performance / Low performance — **Last 20 clusters** Highest disagreement threshold

C — Percentage of clusters remaining — Standard deviation threshold — Bootstrapped difference, Permutated difference, Unsignificant difference, Significant difference — Difference of idiosyncratic bias magnitude