

Identifying Melanoma CNN Image Classification

Evan Staffen

Agenda

- Business Understanding
- Dataset
- Modeling
- Conclusions and Recommendations



WHAT'S THE BIG DEAL?



... AND MELANOMA IS THE MOST DANGEROUS TYPE
OF SKIN CANCER YOU CAN GET

ABOUT **76,100** PEOPLE WILL BE
DIAGNOSED WITH MELANOMA IN THE U.S. IN 2014,

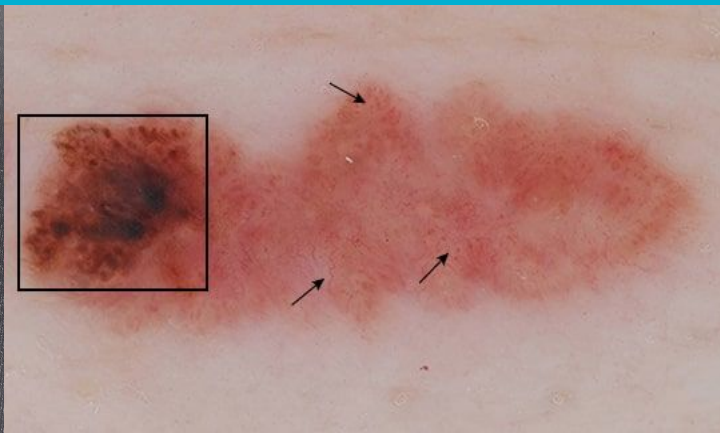


 AND **9,700**
PEOPLE WILL DIE

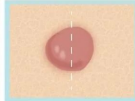

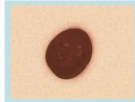





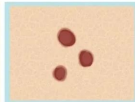
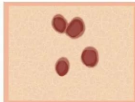
Business Understanding

- 9,500+ skin cancer diagnoses per day
- 20% develop skin cancer in lifetime
- 99% survival rate

Stakeholder: Dermatoscope manufacturers



ABCDEs MOLE or MELANOMA?

MOLE FEATURES		BENIGN	SEE DOCTOR
A	ASYMMETRY ONE HALF OF A MOLE DOES NOT MATCH THE OTHER.		
B	BORDER THE EDGES ARE IRREGULAR, RAGGED, NOTCHED, OR BLURRED. NORMAL MOLES ARE ROUND OR OVAL.		
C	COLOR THE MOLE IS NOT EVENLY COLORED. IT MAY INCLUDE SHADES OF BROWN OR BLACK, OR PATCHES OF PINK, RED, WHITE OR BLUE.		
D	DIAMETER THE SPOT IS LARGER THAN 6 MILLIMETERS ACROSS	 LESS THAN .25 IN	 GREATER THAN .25 IN
E	EVOLVING THE MOLE IS CHANGING IN SIZE, SHAPE, OR COLOR.		

IF CAUGHT & TREATED EARLY, BEFORE IT ADVANCES & SPREADS TO OTHER PARTS OF YOUR BODY, MELANOMA CAN ALMOST ALWAYS BE CURED.

Dataset

International Skin Imaging Collaboration (ISIC) 2019 Challenge
25,331 photos
8 diagnoses

Actinic Keratosis
AK



Basal Cell Carcinoma
BCC



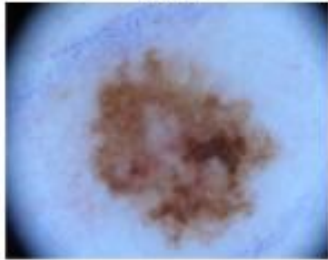
Benign Keratosis
BKL



Dermatofibroma
DF



Melanoma
MEL



Nevus
NV



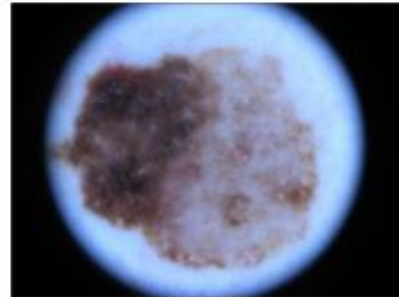
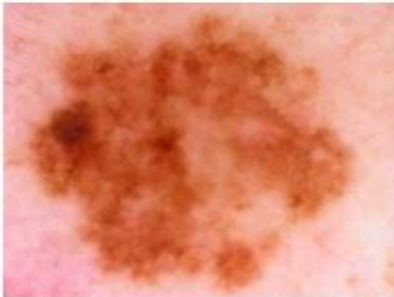
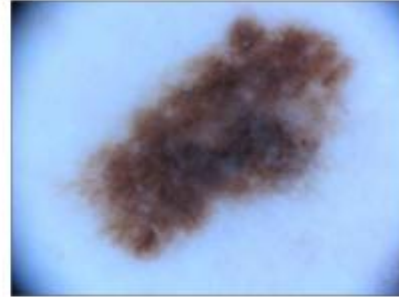
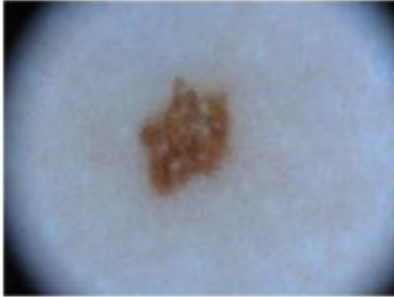
Squamous Cell Carcinoma
SCC



Vascular Lesion
VASC



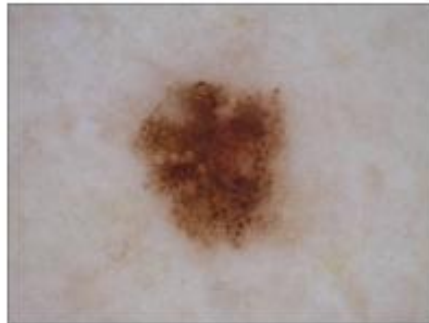
Focus



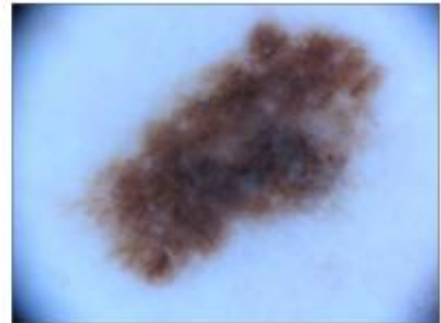
Nevus



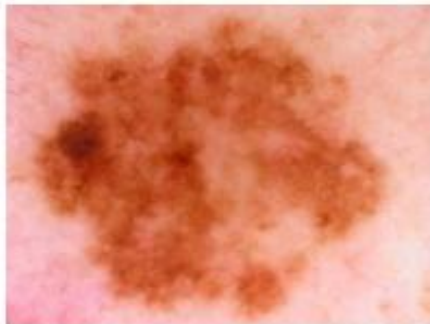
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Nevus



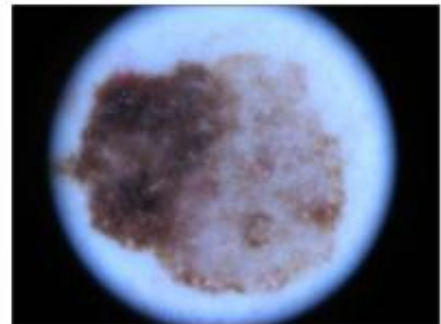
Melanoma



Melanoma



Melanoma










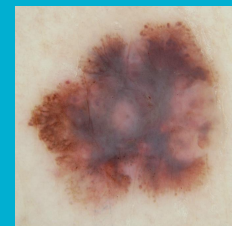
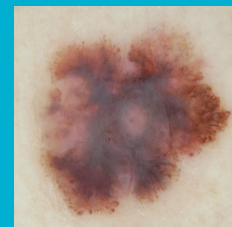
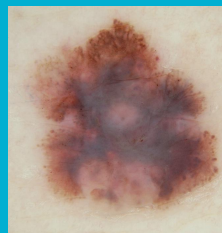
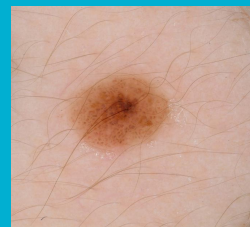
Modeling

Final Accuracy: 78.1%

Final Recall: 83.7%

KNOW YOUR ABCDE's

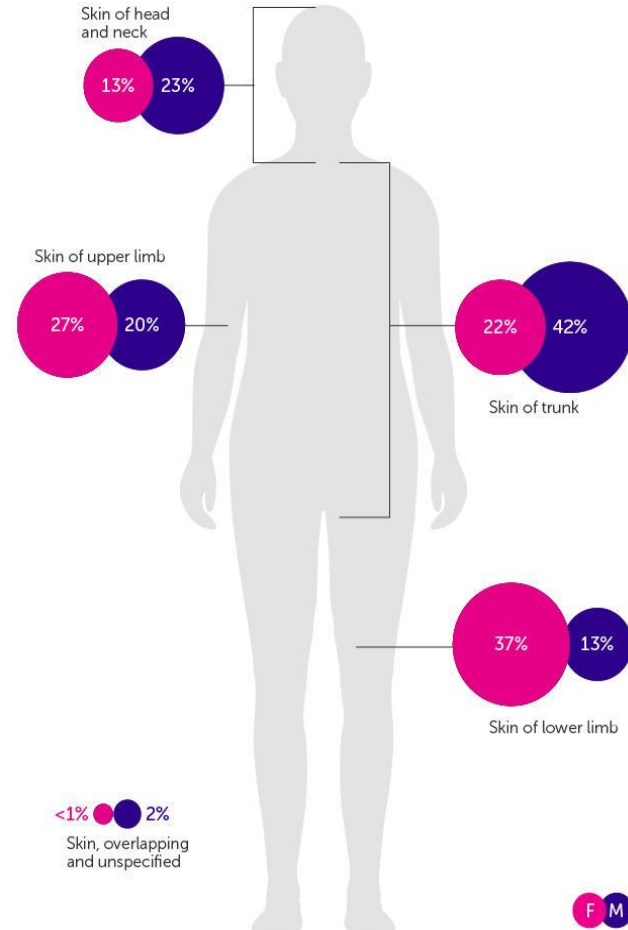
A	B	C	D	E
ASYMMETRY	BORDER	COLOR	DIAMETER	EVOLUTION
				
One half does not match the other half	Uneven borders	Variety of colors like brown, tan, or black	Grows larger than the size of a pencil eraser (¼ inch)	Change in size, shape, color, elevation, another trait, or new symptom



Next Steps

- Multiple lesions in one image
- Account for different types of lesions
- Sex, age, skin cancer history and lesion location

Malignant melanoma skin cancer cases:
percentage distribution by anatomical site



Questions?

Contact

Email: www.evan.staffen@gmail.com

LinkedIn: <https://www.linkedin.com/in/evan-staffen-a74045207/>

GitHub: <https://github.com/evanstaffen/Melanoma-Identification-with-CNNs>