MELANOMA SCREENING THROUGH THE POWER OF AI

New AI tools can help get patients in the door

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EXECUTIVE SUMMARY

01. **MELANOMA PROGNOSIS IS HIGHLY DEPENDENT ON STAGE OF DETECTION**

Early detection means simple treatment procedures that are highly effective.
Late diagnosis requires aggressive and expensive cancer treatment with a much lower survival rate.

02. **OUR AI CAN DETECT MELANOMA FROM IMAGES**

Our tool is 85% effective in distinguishing between harmless moles and harmful melanomas.

03. **HOME SCREENING CAN GET OUR PATIENTS IN-THE-DOOR**

Our tool creates value by bringing in more patients for early melanoma diagnosis, which benefits patients, healthcare systems and our company's bottom line.

MELANOMA: A KILLER CANCER THAT IT HIGHLY TREATABLE

≈100,000

Estimated number of new melanoma diagnoses in the U.S. in 2022

≈7,600

Estimated number of melanoma deaths the U.S. in 2022

99%

5 year survival rate in patients diagnosed when melanoma is localized

30%

5 year survival rate in patients diagnosed when melanoma has spread to distant regions in the body

Source: American Cancer Society - **Survival Rates for Melanoma Skin Cancer**

OUR NEW ARTIFICIAL INTELLIGENCE TOOL

DEEP LEARNING

We've used deep learning methods to train a computer to "see" the differences between skin lesions
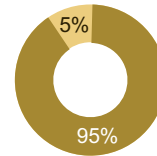
85%

Our model has an 85% chance of correctly discerning between benign lesions and melanoma
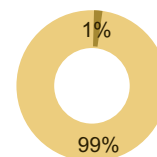
PUT AN IMAGE IN, GET A LABEL OUT

"This is probably **melanoma**"

5%

95%

■ Probability **melanoma**
■ Probability **benign**

"This is probably **benign**"

1%

99%

WHO BENEFITS FROM EARLY DIAGNOSIS & TREATMENT?

PATIENTS

Early diagnosis and biopsy prevents the need for invasive treatments and reduces mortality rates
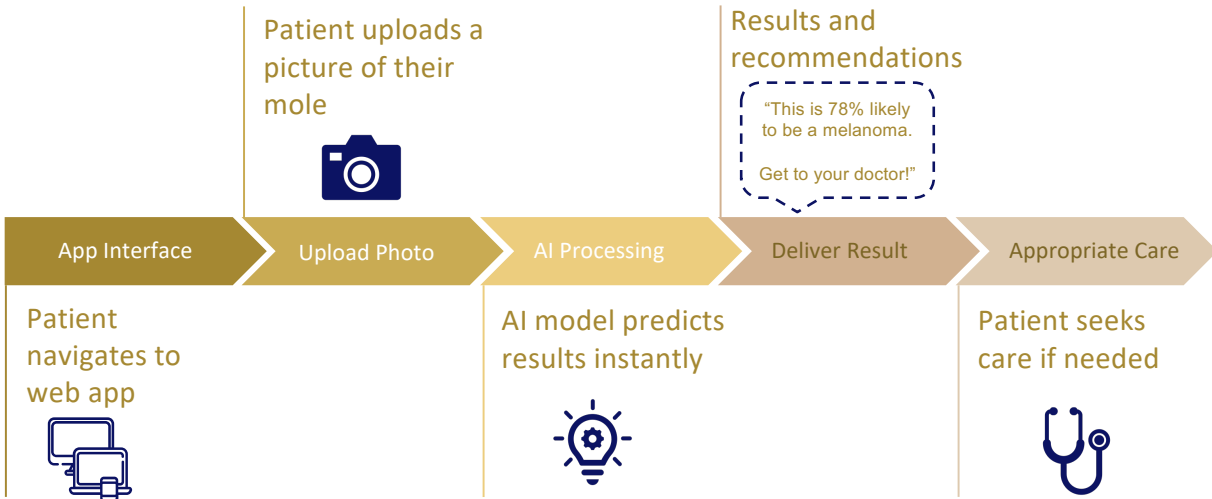
HOSPITAL SYSTEMS

Early diagnosis and treatment reduces hospitalization rates and strain on the hospital systems
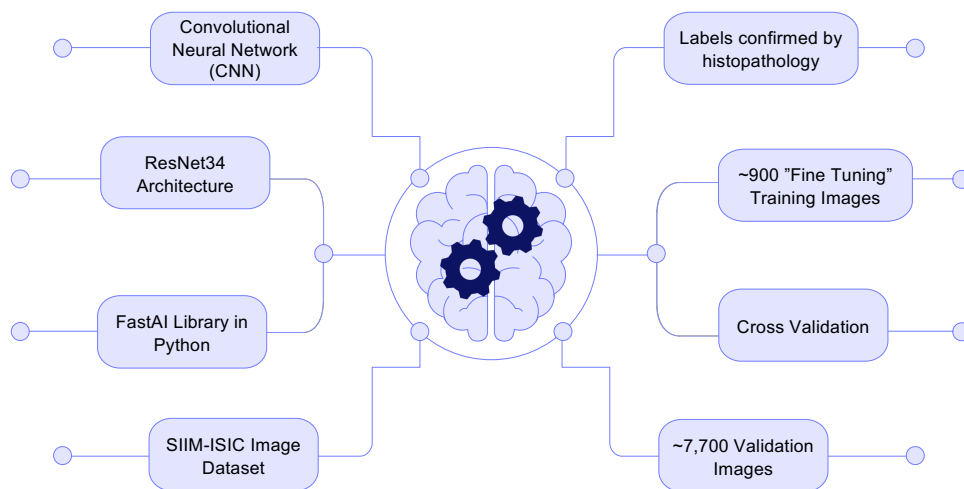
INSURANCE PROVIDERS

Early diagnosis and treatment reduces healthcare costs to the insurance provider

PROPOSED DEPLOYMENT

Patient uploads a picture of their mole

Results and recommendations

"This is 78% likely to be a melanoma.

Get to your doctor!"

| App Interface | Upload Photo | AI Processing | Deliver Result | Appropriate Care |

Patient navigates to web app

AI model predicts results instantly

Patient seeks care if needed

"UNDER THE HOOD": ARCHITECTURE, TRAINING & VALIDATION

Convolutional Neural Network (CNN)

ResNet34 Architecture

FastAI Library in Python

SIIM-ISIC Image Dataset

Labels confirmed by histopathology

~900 "Fine Tuning" Training Images

Cross Validation

~7,700 Validation Images

MODEL LIMITATIONS & NEXT STEPS

	LIMITATION	FUTURE WORK
SAMPLE POPULATION *Skin tone matters*	Model is trained and validated on image samples from people with **non-melanated** skin.	Validate model against samples from other skin tones to evaluate performance.
DATA INPUT *Image only*	Computer vision model uses image data only, and doesn't take into account patient vitals and demographic data.	Incorporating this additional data into the model is likely to improve its performance.
DEPLOYMENT *From development to use*	The current model only exists on my computer at the moment.	Developing a web app interface and building out the user experience pipeline.

THANK YOU!

What questions do you have?

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