



# The emdee.ai skin lesion detector

*From a Stanford paper to  
the National Geographic Magazine*



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# Stanford paper (2017)

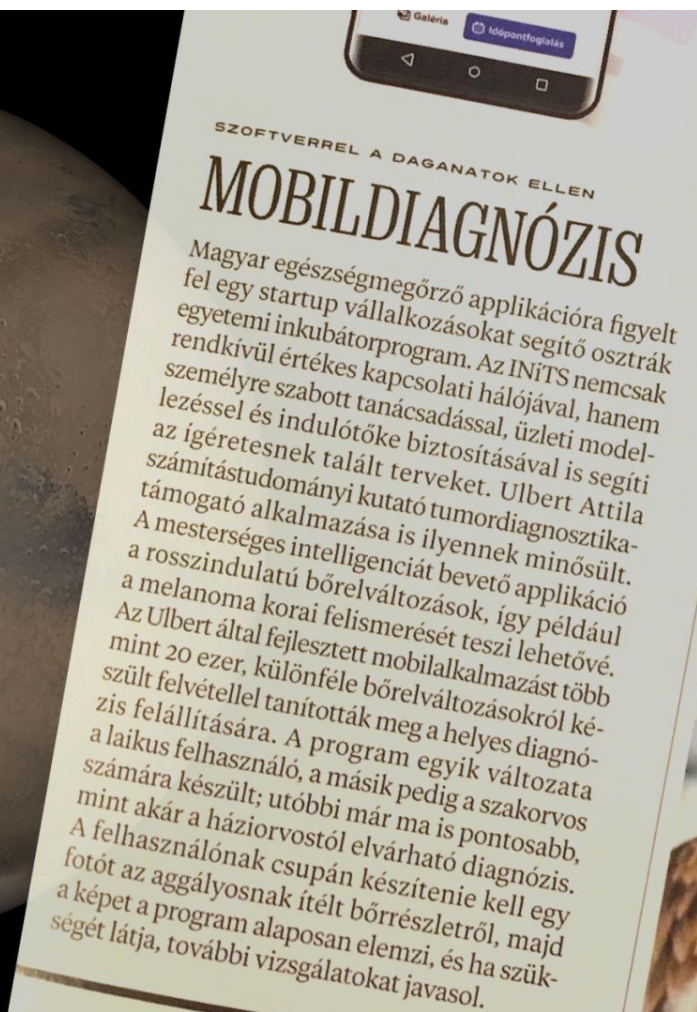
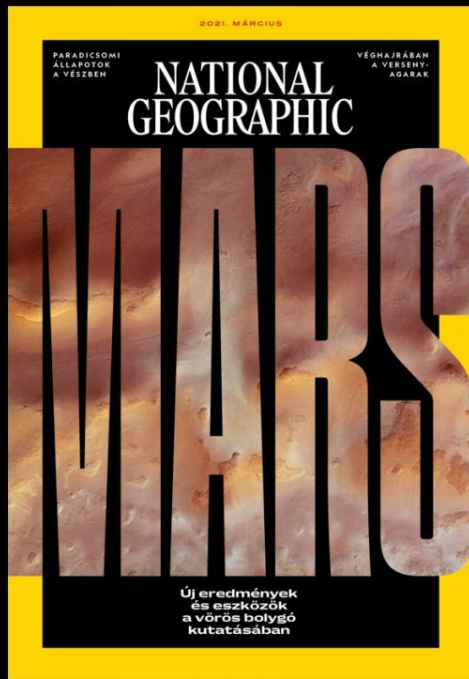


## LESIONS LEARNT

Artificial intelligence powers detection  
of skin cancer from images **PAGES 36 & 115**

“We train a CNN using a dataset of 129,450 clinical images—two orders of magnitude larger than previous datasets — consisting of 2,032 different diseases. We test its performance against 21 board-certified dermatologists...”

# March 2021





(2018)  
**Fewer**

**Severe**  
cases

**Duplicate**  
operations

**Unnecessary**  
operations

# Project with the Clinic & the ISIC 2018 competition

*Regular & dermoscopic images* on an external HDD in directories with “standardized” directory names: each directory belongs to a visit, the directory name contains the diagnosis.

Training CNNs  
Ensemble  
Preprocessing  
Hyper-parameter tuning

## ISIC 2018

Number 3 on ROC AUC

Number 34 in balanced multiclass accuracy

Paper: Skin Lesion  
Classification by  
Multidimensional Ensembling

# Mayor issues on clinical images

Images of the clinic are incorrectly detected. Melanoma AUC, sensitivity, specificity values were terrible.

## Root cause

Diagnosis is in the directory name, but those are *sometimes clinical diagnoses, sometimes histology results*.

Actual histology reports are in a *medical software*.

A directory can *contain photos of several lesions* taken at a visit and it cannot be known what photos belong to the histology result.

**No ground truth: We don't know which lesions biopsied, and we cannot associate the histology report with the individual images.**

# 2019: Starting (almost) over

Label images with histology results...

...but it requires investment in terms of time and tooling (~120000 images).

Interviews with the photographer, pathologist, doctors, etc.

It turned out that things are a “bit” different than we have thought.



# The Product

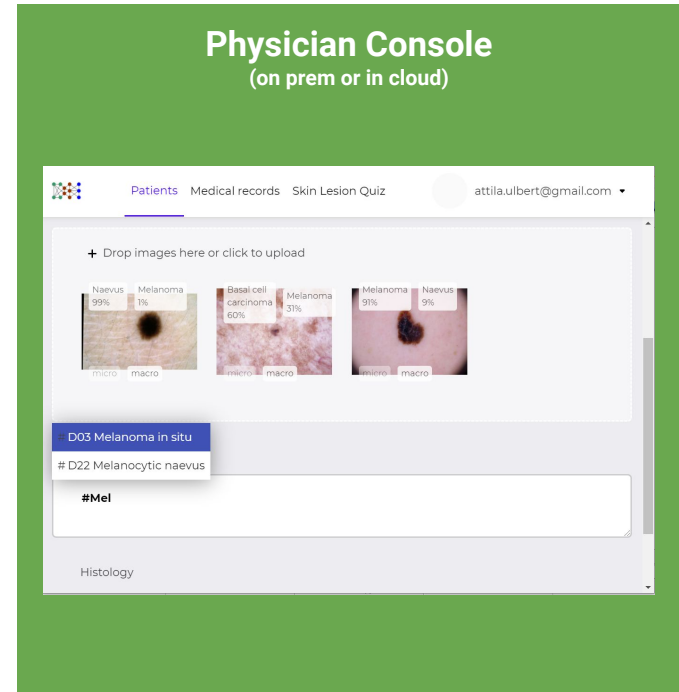
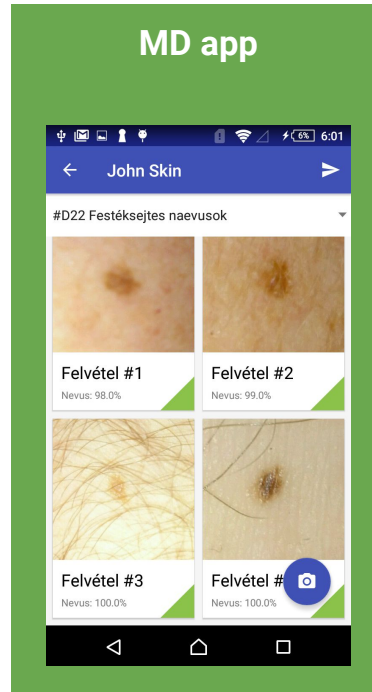
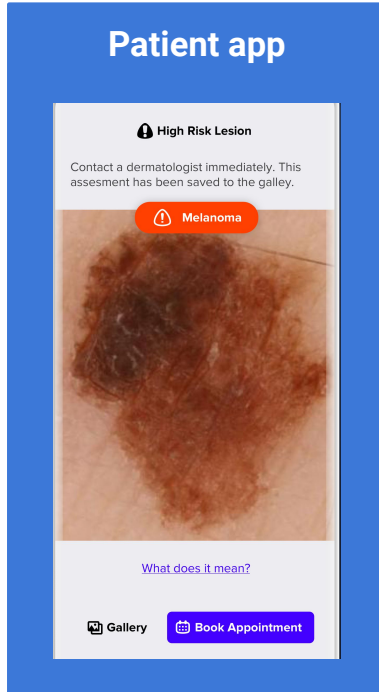
ASSESS  
(Patient)



BOOK APPOINTMENT  
(Patient)

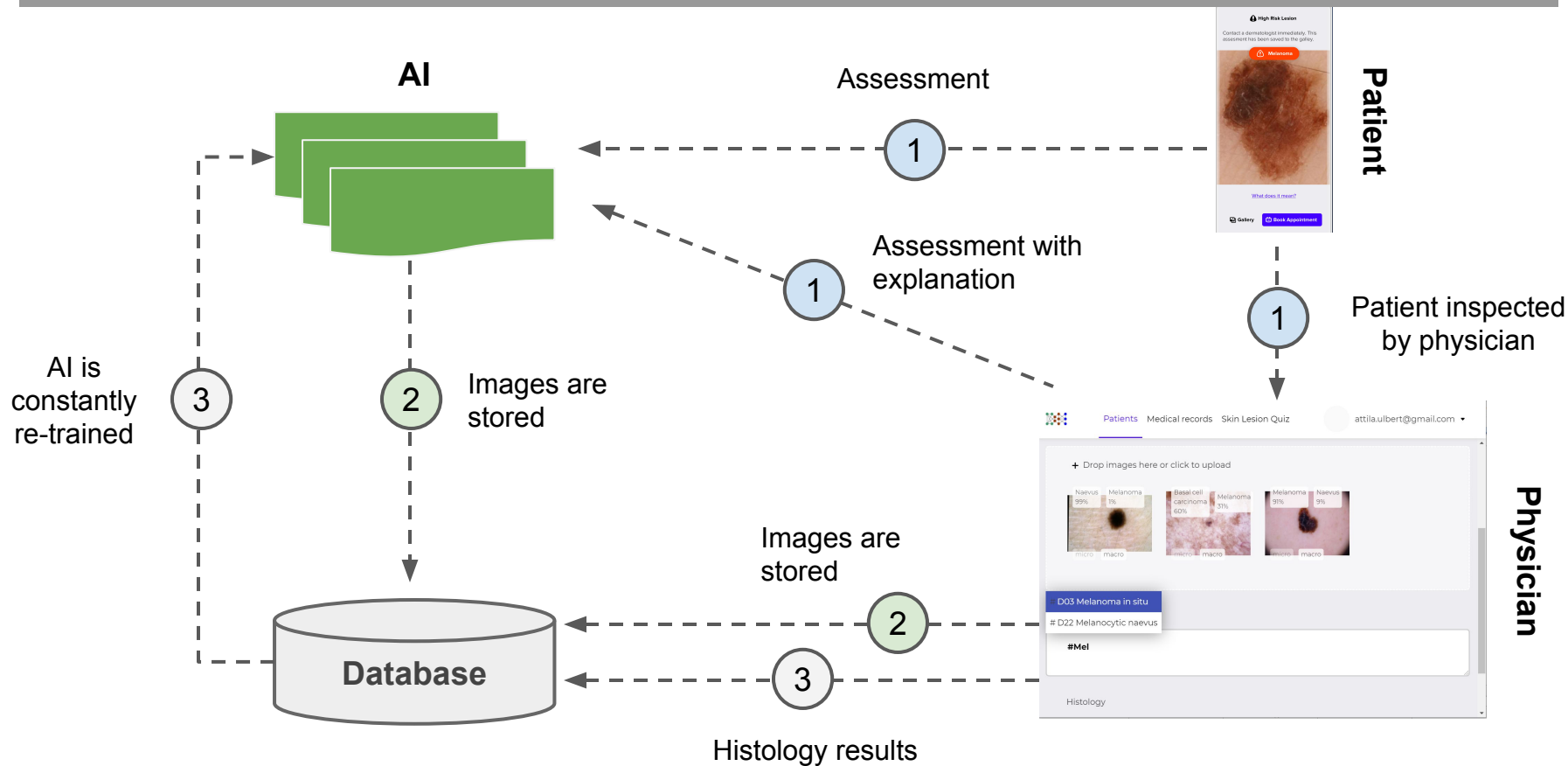


EXAMINE  
(Dermatologist or GP)





# Superhuman performance with continuous learning



# The quiz on BőrAkadémia

ConventiOnLine

Videó szekciók

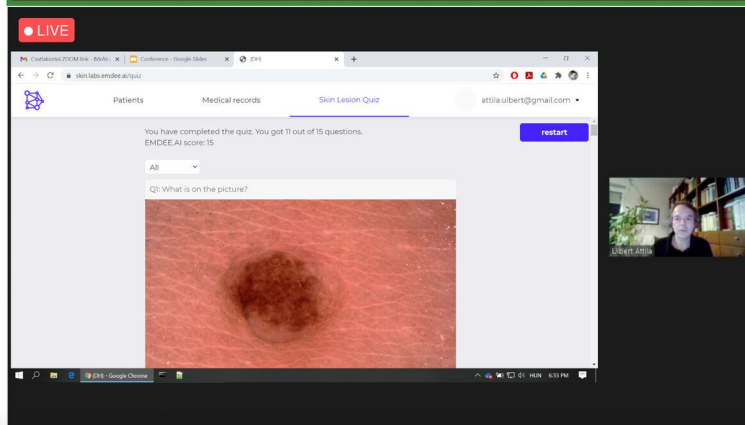


2021.03.05., péntek

Kezdés: 2021. 03. 05. 8:30:00

Befejezés: 2021. 03. 05. 19:10:00

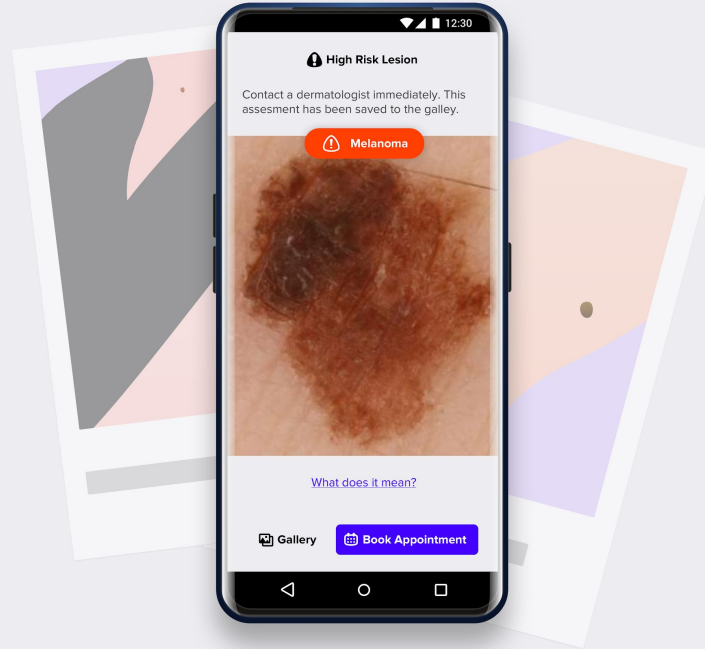
15 images  
4 categories



Results  
Dermatologists: 11  
emdee.ai: 15

<https://skin.labs.emdee.ai>

# emdee Skin



<https://emdee.ai/>

<https://play.google.com/store/apps/details?id=com.digitalhealth.android.comm>

Category	Sensitivity	Specificity
Basal cell carcinoma (332)	99%	99%
Benign keratosis (262)	97%	99%
Melanoma (452)	92%	99%
Nevus (1287)	99%	97%

