/Salut

Eines de Diagnosi de càncer de pell

Josep Malvehy

Servei de Dermatologia

Hospital Clínic de Barcelona

Clínic Barcelona | Universitat de Barcelona


iToBOS


Fundació
La Marató de TV3


IDIBAPS
Institut
D'Investigacions
Biomèdiques
August Pi i Sunyer


MELCAYA


EADV
European Academy of
Dermatology and Venereology


TRANSCAN


GenoMEL
the Melanoma Genetics Consortium

M-Skip


GOBIERNO
DE ESPAÑA
MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD
Instituto
de Salud
Carlos III


BioGenoMEL


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ciberer
CENTRO DE INVESTIGACIÓN BIOMÉDICA EN RED
DE ENFERMEDADES RARAS


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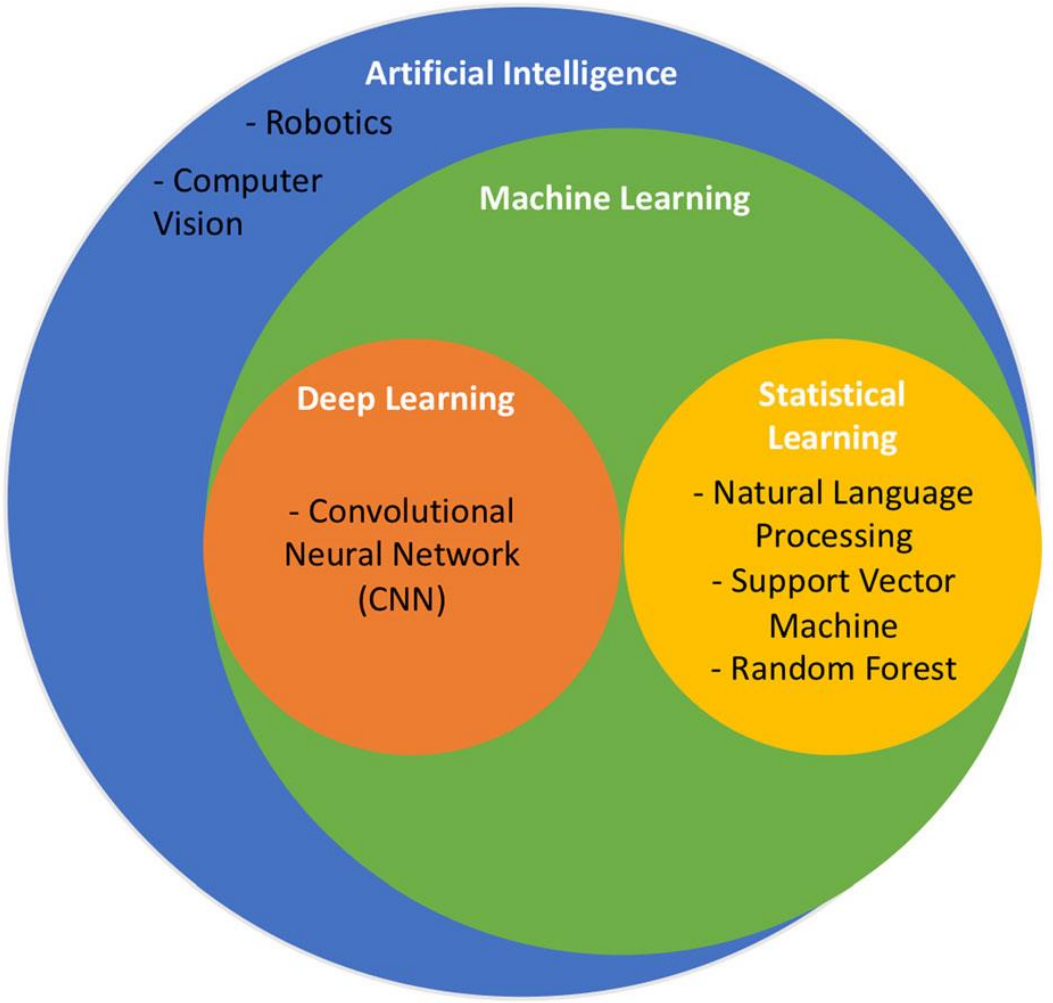
i de Recerca

IA EN CÀNCER CUTANI

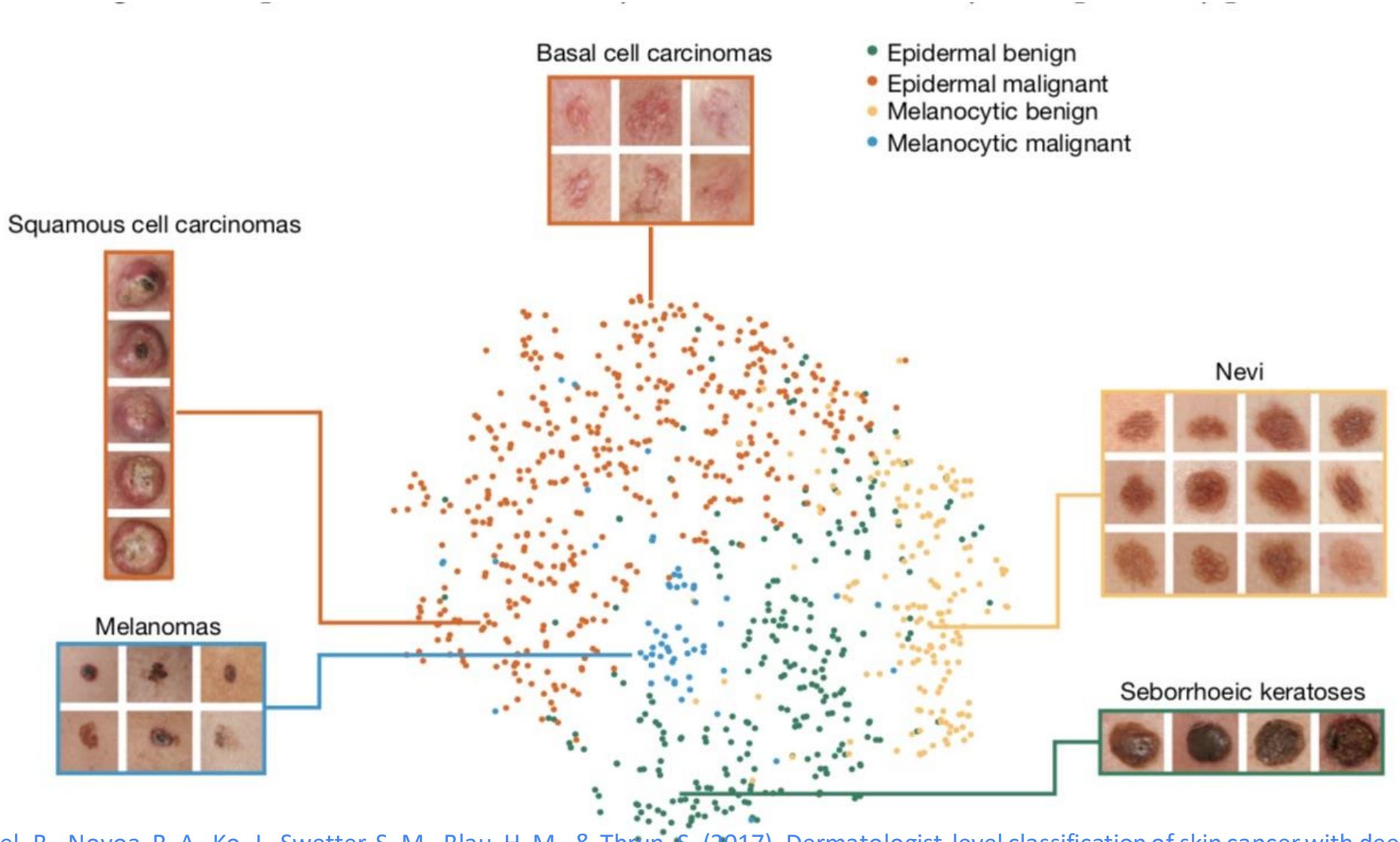
5 àrees d'aplicació.

1. Classificació de la malaltia mitjançant imatges
2. Classificació de la malaltia mitjançant imatges de dermatopatologia
3. Avaluació de malalties mitjançant aplicacions mòbils i dispositius de monitoratge personal
4. Facilitar la investigació epidemiològica a gran escala
5. Medicina de precisió



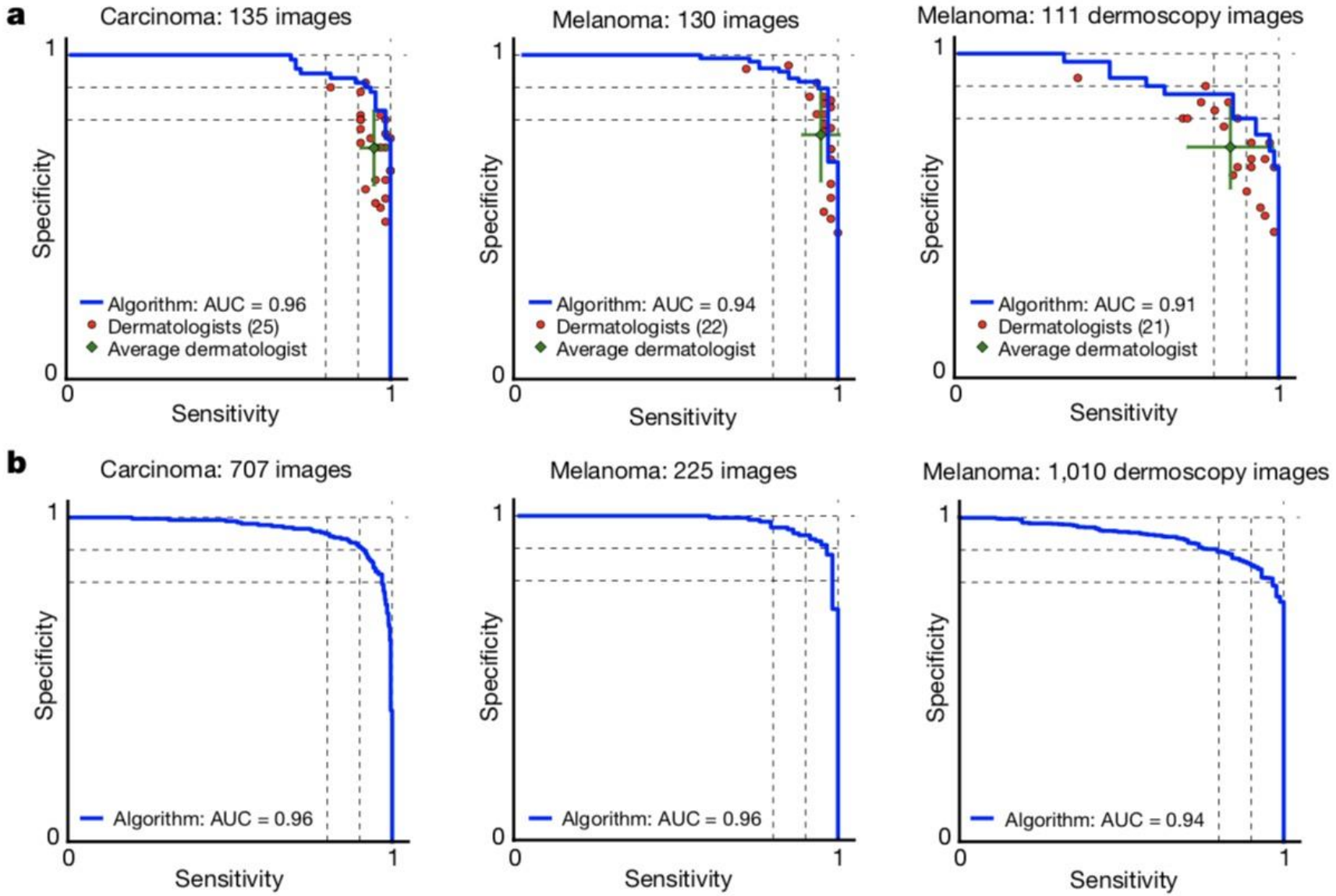
Chan S, Reddy V, Myers B, et al. Machine Learning in Dermatology: Current Applications, Opportunities, and Limitations. Dermatol Ther (Heidelb). 2020 Jun;10(3):365-386.

Man againts Machine



Esteva, A., Kuprel, B., Novoa, R. A., Ko, J., Swetter, S. M., Blau, H. M., & Thrun, S. (2017). Dermatologist-level classification of skin cancer with deep neural networks. *Nature*, *542*(7639), 115–118.

Nature 2017



Esteva, A. et al. *Nature* (2017). *542*(7639), 115–118.

2017: AI “better than dermatologist” at detecting skin cancer

BBC

Health

Artificial intelligence 'as good as cancer doctors'

26 January 2017

By James Gallagher

CNN Health » Diet + Fitness | Living Well | Parenting + Family Live TV U.S. Edition +

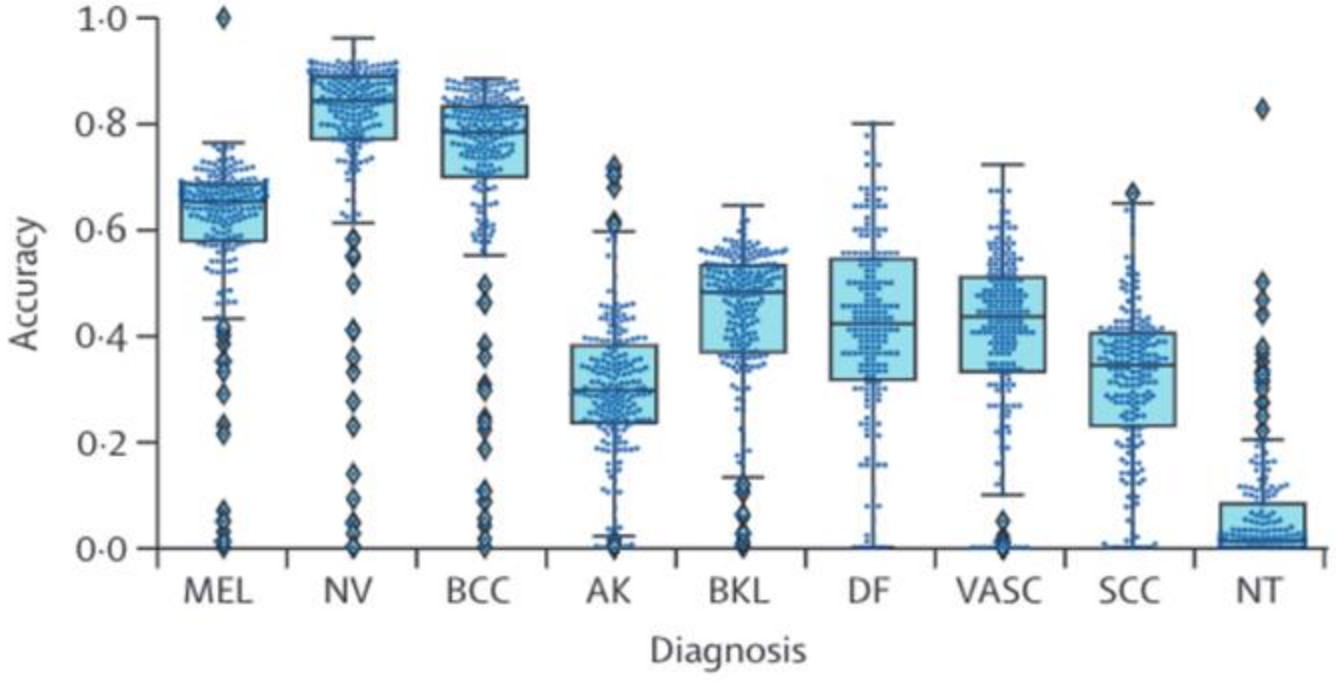
'Automated dermatologist' detects skin cancer with expert accuracy

By Susan Scutti, CNN

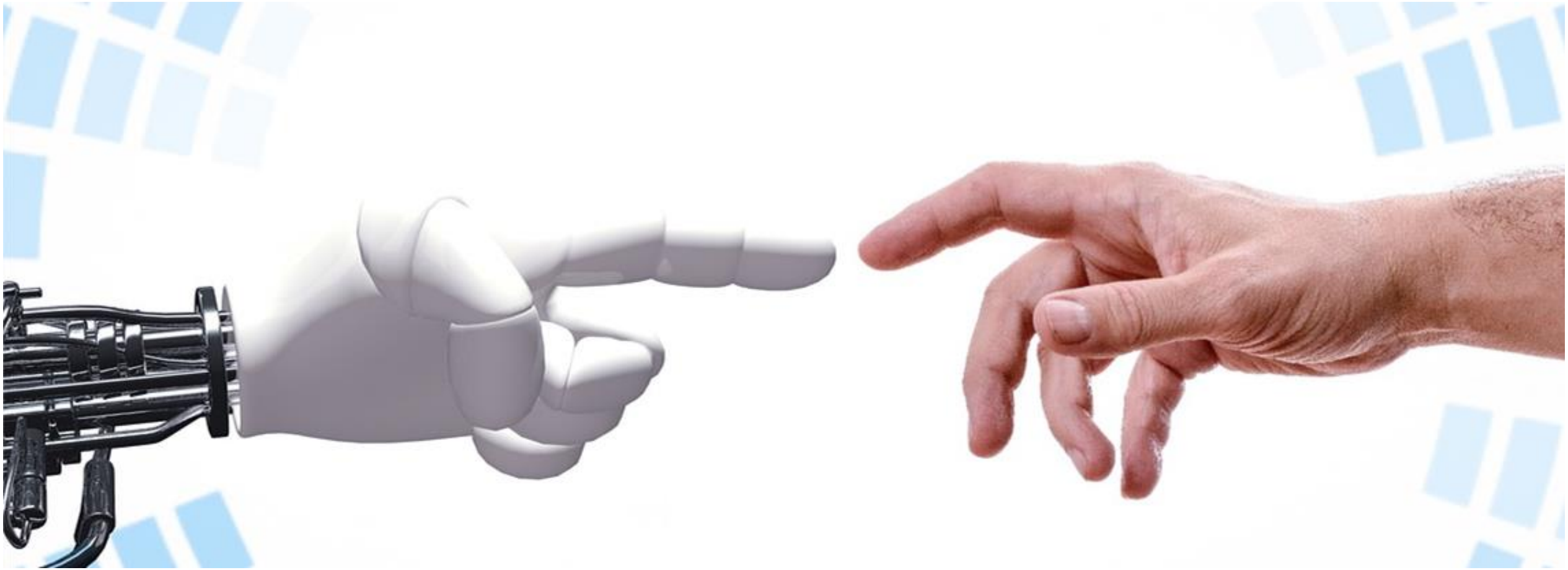
Updated 6:37 PM ET, Thu January 26, 2017

Current Deficiencies of AI for Skin Cancer Diagnosis: Validation of prediction models for skin cancer detection on dermoscopy images in the 2019 International Skin Imaging Collaboration (ISIC) Grand Challenge. Digital Lancet Oncology 2019

Marc Combalia MS, Noel Codella PhD, Veronica Rotemberg MD, Cristina Carrera MD, Stephen Dusza PhD, David Gutman MD, Brian Helba, Harald Kittler MD, Nicholas R. Kurtansky BS, Konstantinos Liopyris MD, Michael A. Marchetti MD, Sebastian Podlipnik MD, Susana Puig MD, Christoph Rinner PhD, Philipp Tschandl MD, Jochen Weber, Allan Halpern MD, and Josep Malvehy MD



	NV	BKL	MEL	SCC	AK	BCC	VASC	DF	NT
Inflammatory disease	0·055	0·072	0·025	0·095	0·19	0·36	0·02	0·081	0·10
Benign neoplasm	0·096	0·12	0·059	0·053	0·13	0·28	0·072	0·073	0·11
Normal variant	0·13	0·089	0·31	0·086	0·07	0·13	0·049	0·015	0·12
Scar	0·029	0·055	0·082	0·048	0·19	0·44	0·019	0·033	0·10
Infectious disease	0·16	0·18	0·074	0·11	0·065	0·12	0·081	0·072	0·14



Augmented Intelligence - Human Machine Collaboration - Nature 2020

Single human raters (top) achieve the lowest mean accuracy (64.8%, 95% CI 62.4%to 67.3%; n = 600 images).The highest accuracy is achieved by combining AI-based multi-class probabilities and human collectives (bottom), which is significantly higher than for collectives alone (81.0%, 95% CI 78.2% to 83.9%;P = 8.6 Å~ 10−9; n = 600 images).

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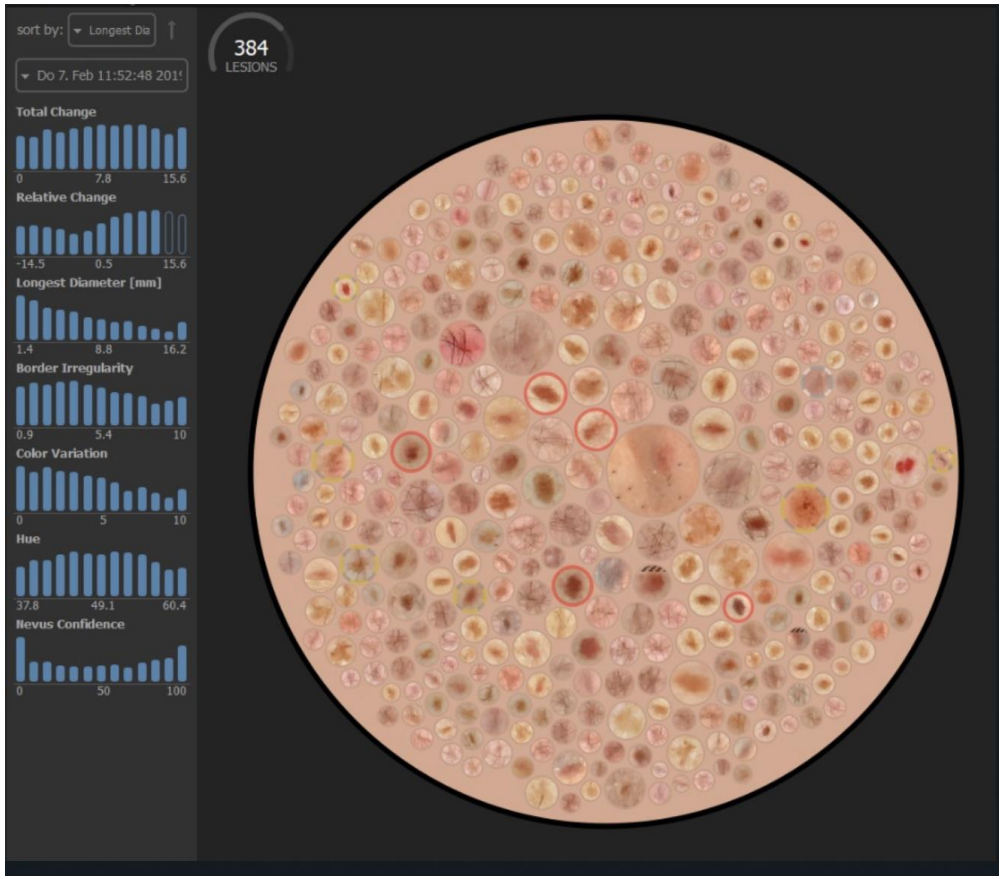
SCANNER 3D



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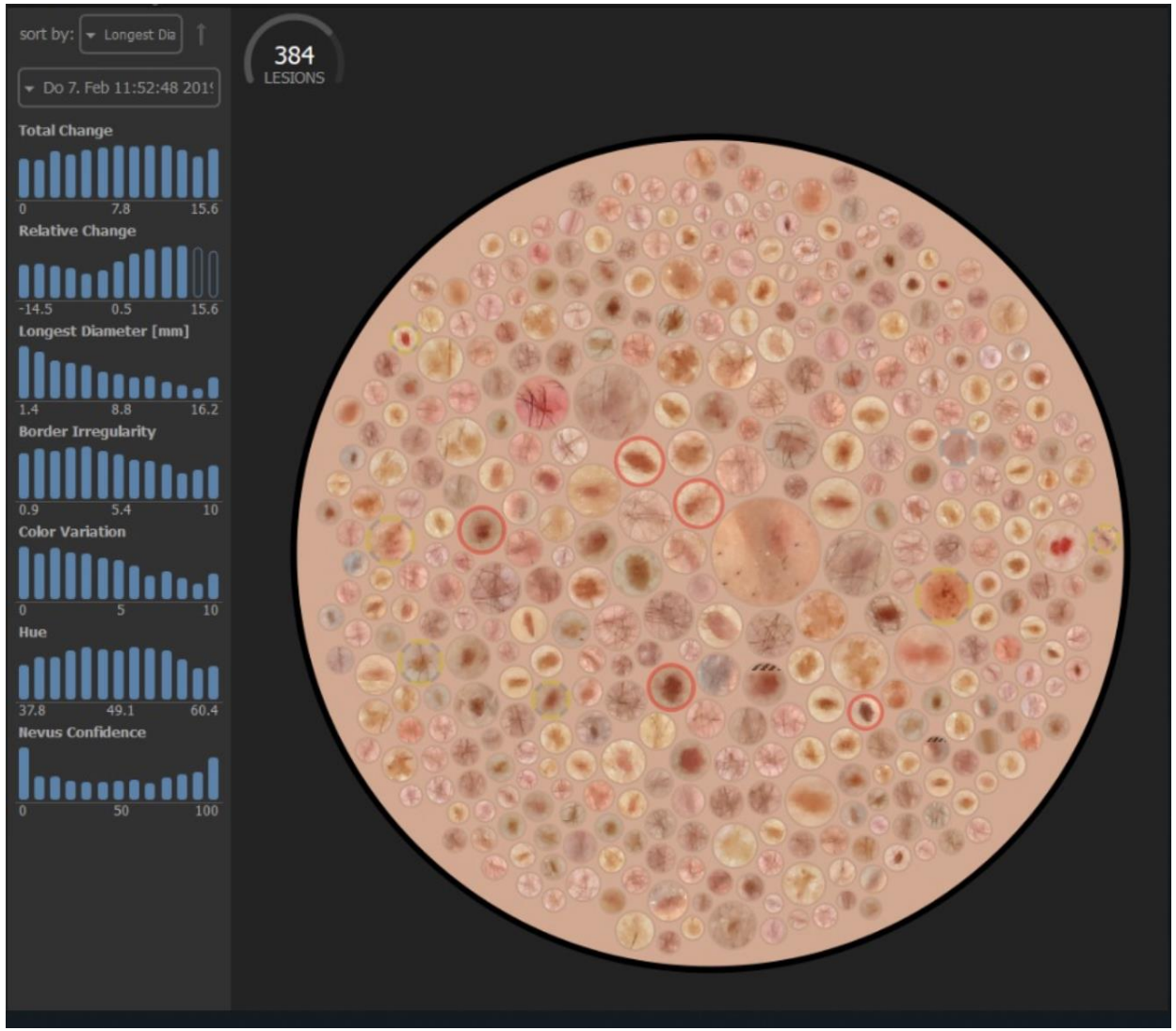

sort by:
Longest Dia
Do 7. Feb 11:52:48 201
384
LESIONS
Total Change
0
7.8
15.6
Relative Change
-14.5
0.5
15.6
Longest Diameter [mm]
1.4
8.8
16.2
Border Irregularity
0.9
5.4
10
Color Variation
0
5
10
Hue
37.8
49.1
60.4
Nevus Confidence
0
50
100

lista de trabajo
0 / 19 imágenes

0 1 18 0 0 0
filtrar por estado

Lesión 15
07/07/2022
Follow-up

15X
clara
polarización

07/07/2022 8:54:31

07/07/2022

Risk assessment

10.0

Knowledgebase

AI lesion match

MEL MEL MEL MEL

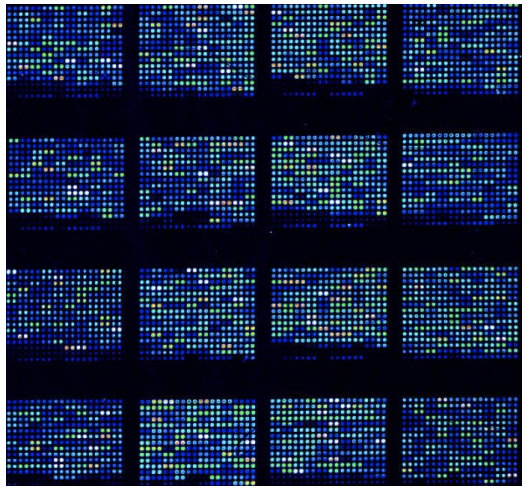
asymmetry 3.2
border 1.5
color 4.1
diameter 13.5mm

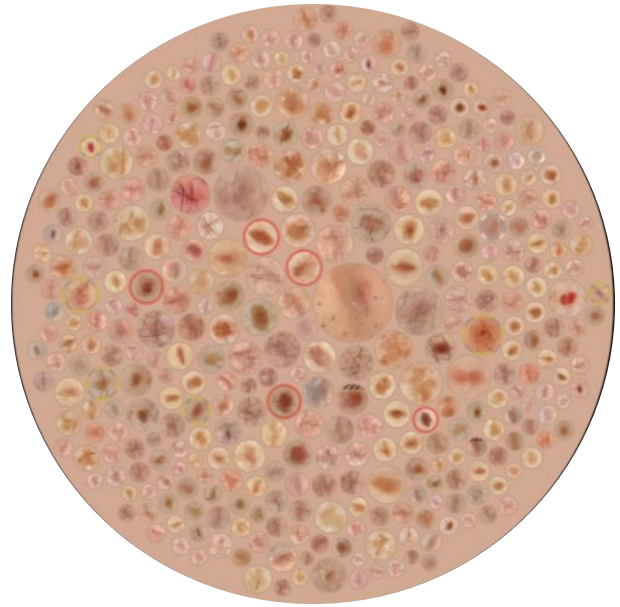
DEXI Dermoscopy Explained Intelligence

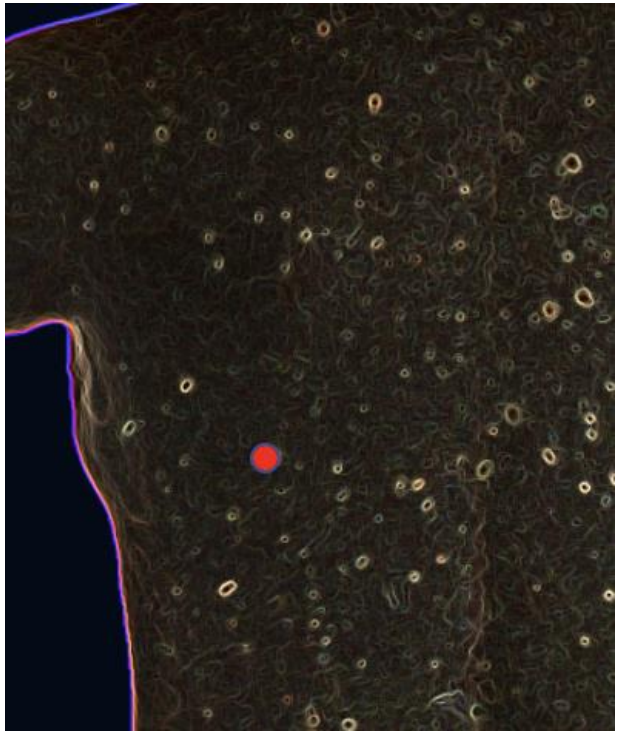
07/07/2022 8:54:42 - HCP\KSKVECTRA
Configurar estado de lesión 15 a Follow-up.

07/07/2022 8:54:40 - HCP\KSKVECTRA
Configurar estado de lesión 15 a No remark.
Configurar nombre de lesión como 15.

Vista en vivo







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Barreres

Cost

Temps

Expertesa

Nombre limitat de centres

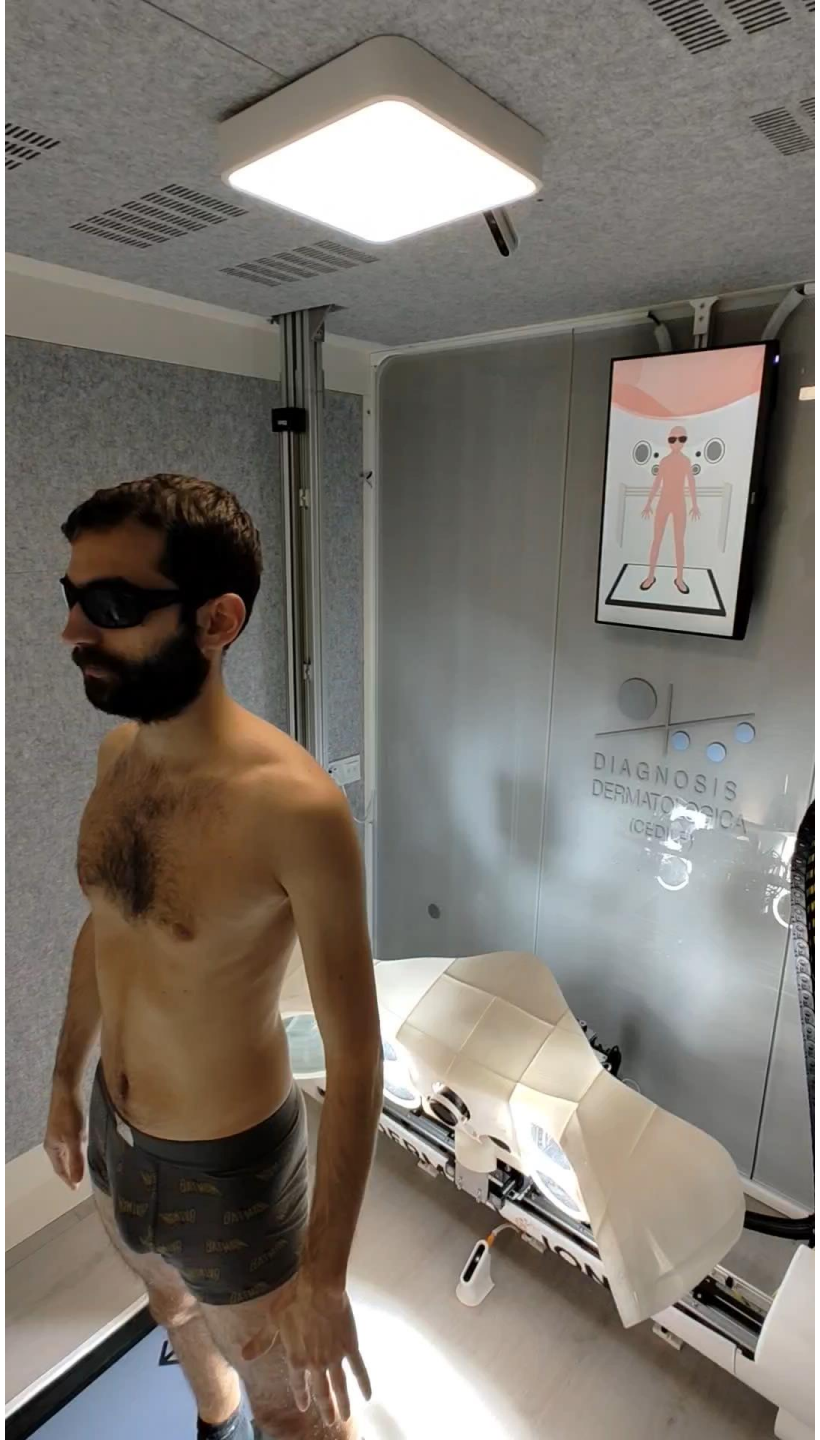
Només per pacients amb alt risc per melanoma

Automatic Scanner TBP+Dermoscopy

- No human intervention for TBP and Digital Dermoscopy
- The patient follows the instructions of the robot
- Automatic detection of body position
- TBP (n=36) with polarised light
- Software for the detection of lesions (Computer vision)
- High resolution dermoscopic photos of the lesions

- Preliminary results in 50 volunteers
- Time of imaging (TBP+Dermoscopy)= 10 min (6-12 min)
- Number of lesions = 2-40

Comparative analysis of dermoscopic image quality obtained using a new automatised device and current manual dermoscope. N. Ricart, E. Campmol, N. Lobos, J. Gimenez, S. Andreani, L. Serra, J.Malvehy . EADO 2022

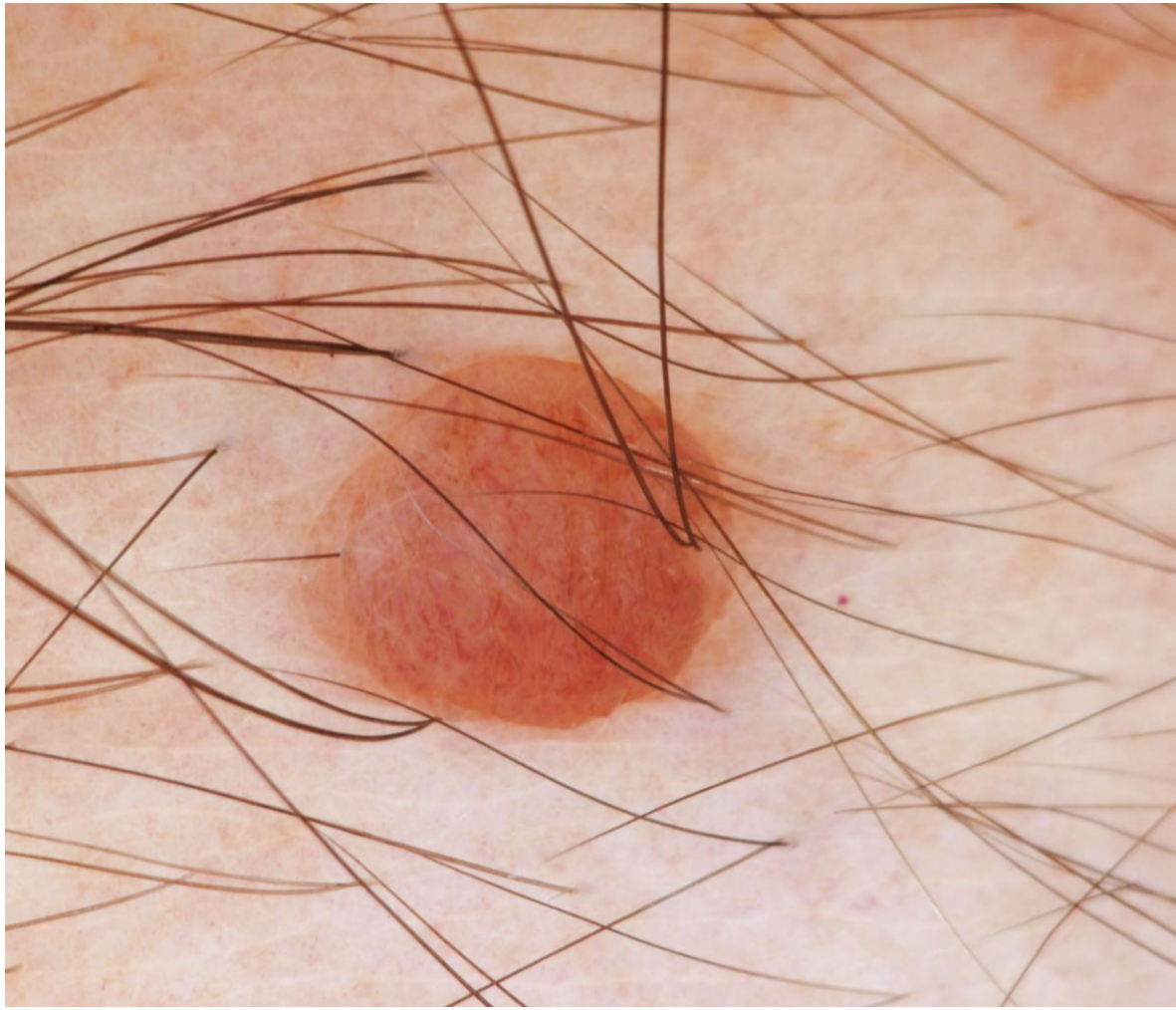


DERMAVISION SOLUTIONS


DIAGNOSIS


DERMAVISION
SOLUTIONS

Dermoscopy images from the Scanner

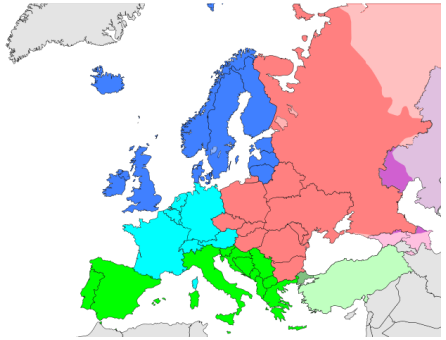


Apps amb IA per diagnòstic de càncer cutani

Task Force of Artifical Intelligence of the European Academy of Dermatology and Venereology (EADV)

European Academy of Dermatology and Venereology

"The mission of the AI Task Force is to influence, promote and develop this field within Dermatology and Venereology, to provide i) a mechanism for greater engagement of EADV members in AI and ii) links to existing subspecialty and other scientific and professional societies including the area of Health, Digital Health and other specialties".



Creation of communication tools for the management of the Task Force, projects and dissemination

Education in AI for dermatologists, students, residents, patients, general public, computer scientists

Radar of AI groups/projects in Dermatology in Europe (and worldwide)

Collaborative research and innovation in AI in Dermatology and Venereology

POSITION PAPERS on AI and Dermatology

Analyses of the regulatory policies of software using AI (European Directives set forth by the European Commission)

Apps in Dermatology using AI: Position statement of the EADV Artificial Intelligence Task Force

EADV 2023

Risks

Potential risks due to inaccuracy, limited reliability, especially when analyzing suspicious skin lesions for features of skin cancer.

Education

Lack of education and proper information for users on how to correctly select lesions that are suspicious of skin cancer.

Regulation

Lack of proper regulation is another significant concern related to dermatology smartphone apps.

Opportunity

Have the potential to become reliable screening tools. . These apps may provide increased access to dermatological care.

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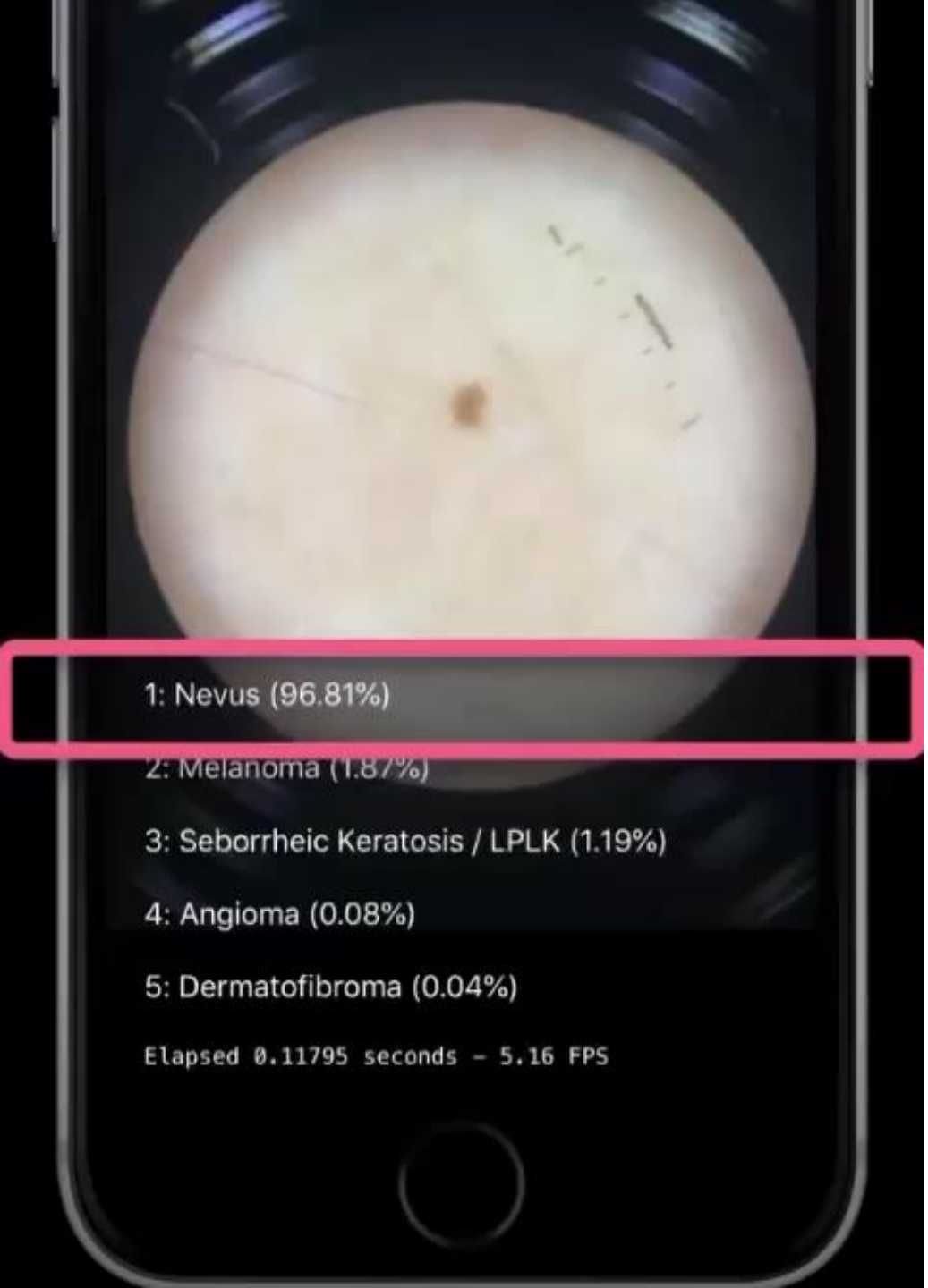

Courtesy of P.Tschanldt

Model de desenvolupament d'una eina de detecció de càncer cutani en atenció primària

Eina amb entrenament in silicco (BBDD ISIC)		2022-2023
Re-entrenament amb BBDD d'Atenció primària		2023
Estudi clínic		2024
Implementació	• Certificació de l'eina • Formació dels usuàris i dels pacients	2025

Conclusions

- Estudis publicats amb bases de dades d'imatges d'uns tipus de tumors de pell (no en entorn real).
- Existeixen eines d'IA en Apps llicenciades a la UE per l'avaluació del risc de malignitat dels tumors cutanis

- **Avaluació de les eines d'IA en un entorn de práctica real**
- **Transparència, Certificació, Formació i Implementació**

/Salut