



# Case Presentation 2

Albert C. Yang, M.D., Ph.D.

Institutes of Brain Science/Digital Medicine Center  
National Yang-Ming University

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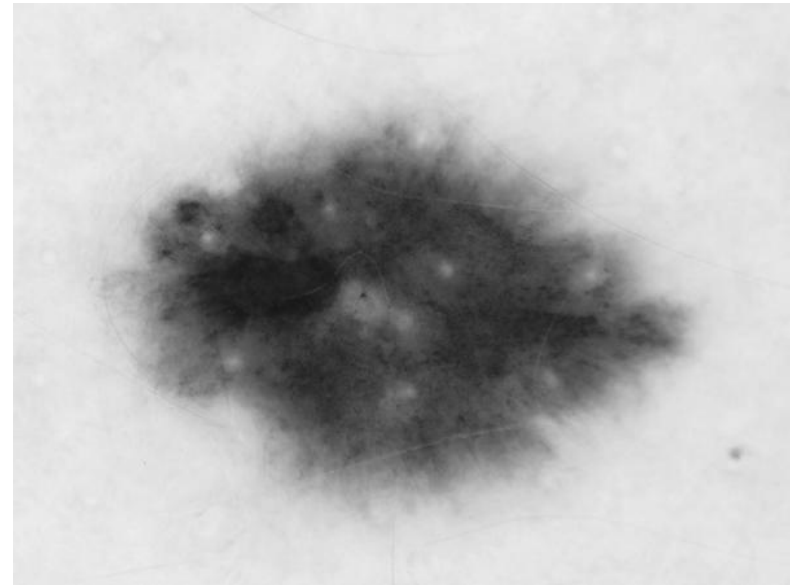
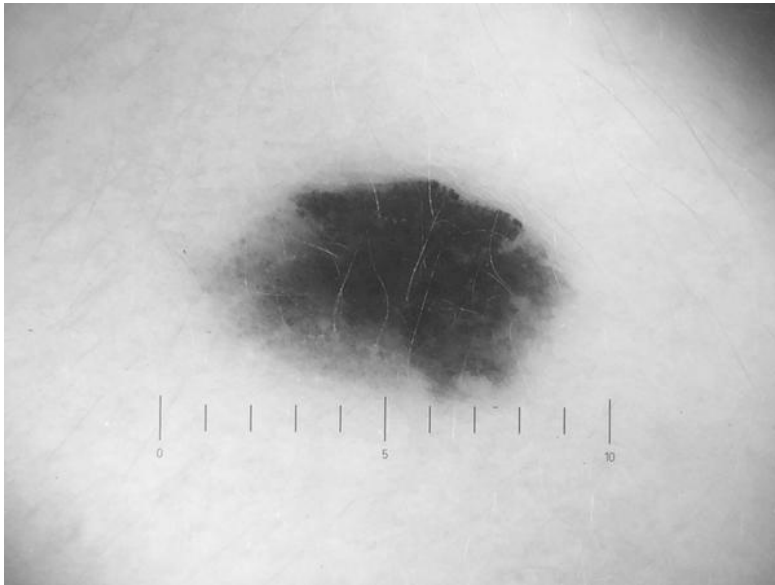
[accyang@gmail.com](mailto:accyang@gmail.com)

# Case Presentation 2

## Diagnosing Melanoma

2000 Dermatology Images

1000 Benign Nevus; 1000 Melanoma



# Data Source

## SCIENTIFIC DATA

OPEN

### Data Descriptor: The HAM10000 dataset, a large collection of multi-source dermatoscopic images of common pigmented skin lesions

Received: 25 April 2018

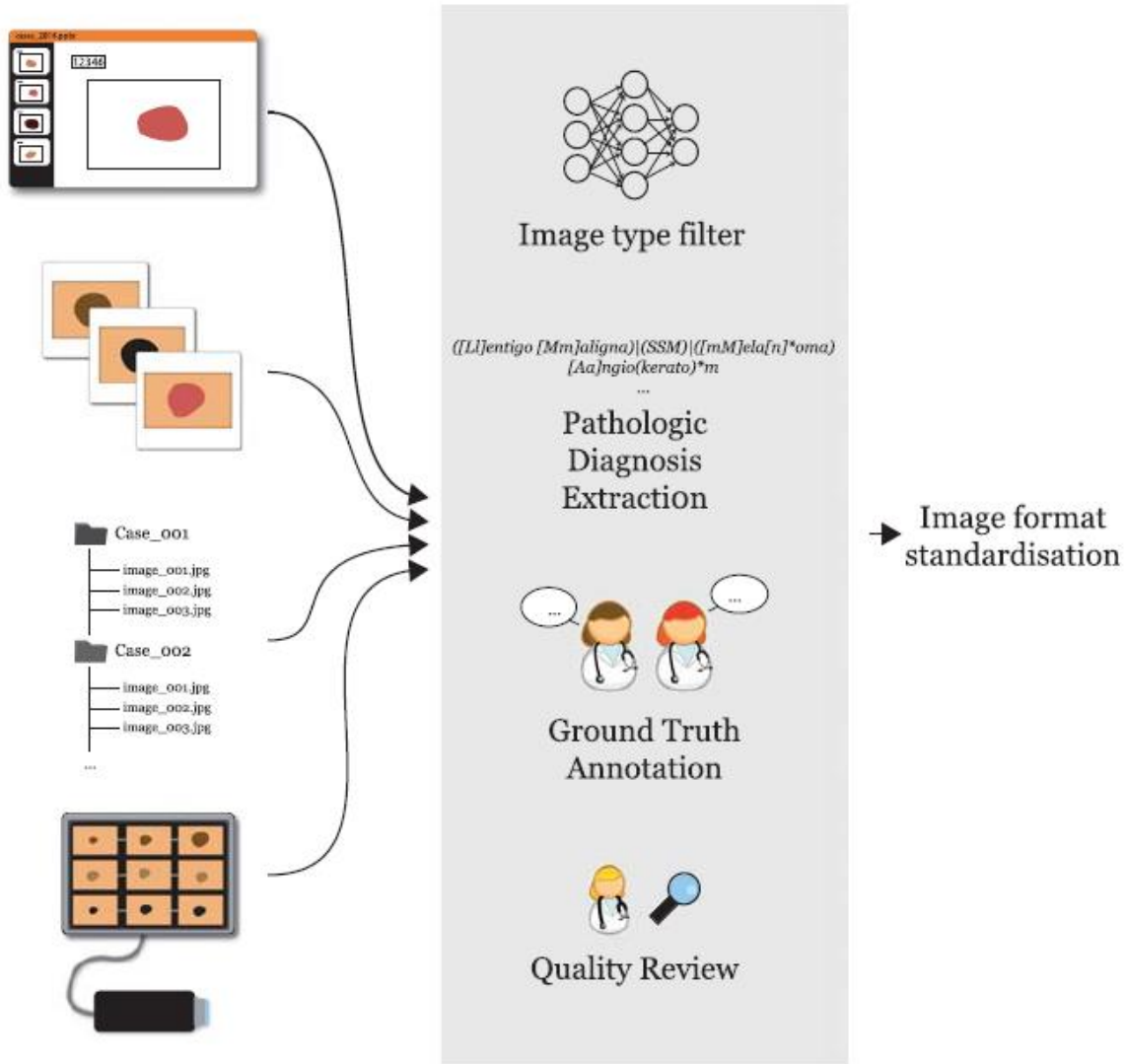
Accepted: 26 June 2018

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Philipp Tschandl<sup>1</sup>, Cliff Rosendahl<sup>2</sup> & Harald Kittler<sup>1</sup>

Training of neural networks for automated diagnosis of pigmented skin lesions is hampered by the small size and lack of diversity of available datasets of dermatoscopic images. We tackle this problem by releasing the HAM10000 (“Human Against Machine with 10000 training images”) dataset. We collected dermatoscopic images from different populations acquired and stored by different modalities. Given this diversity we had to apply different acquisition and cleaning methods and developed semi-automatic workflows utilizing specifically trained neural networks. The final dataset consists of 10015 dermatoscopic images which are released as a training set for academic machine learning purposes and are publicly available through the ISIC archive. This benchmark dataset can be used for machine learning and for comparisons with human experts. Cases include a representative collection of all important diagnostic categories in the realm of pigmented lesions. More than 50% of lesions have been confirmed by pathology, while the ground truth for the rest of the cases was either follow-up, expert consensus, or confirmation by in-vivo confocal microscopy.

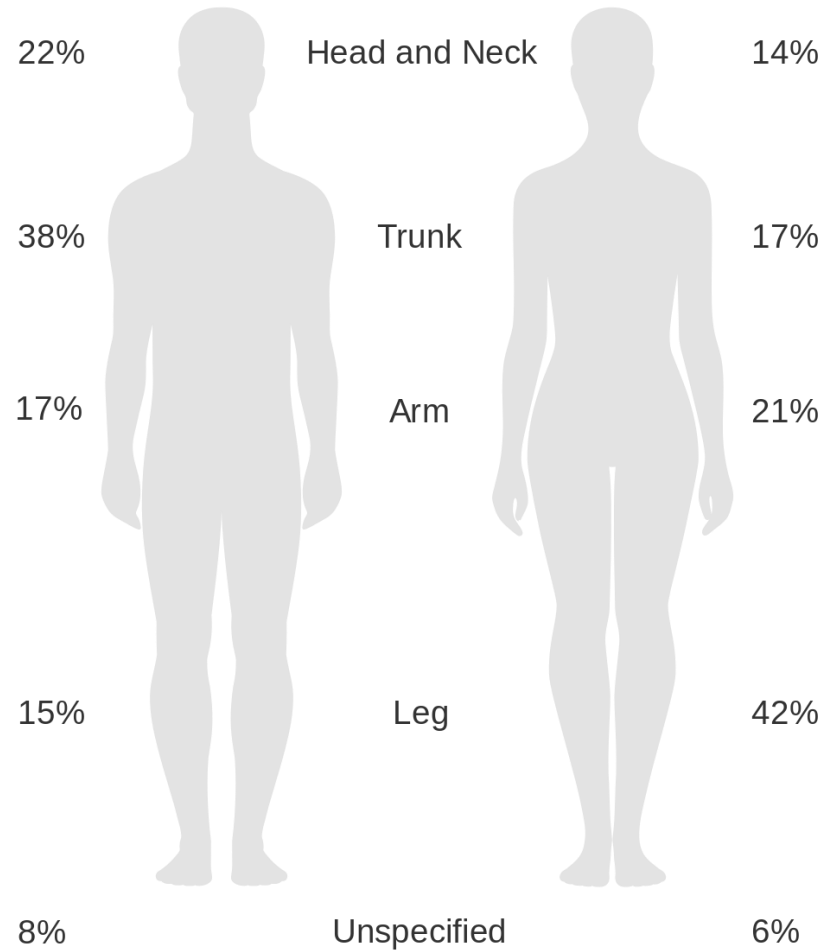
# Data Validation



# Nevus vs. Melanoma

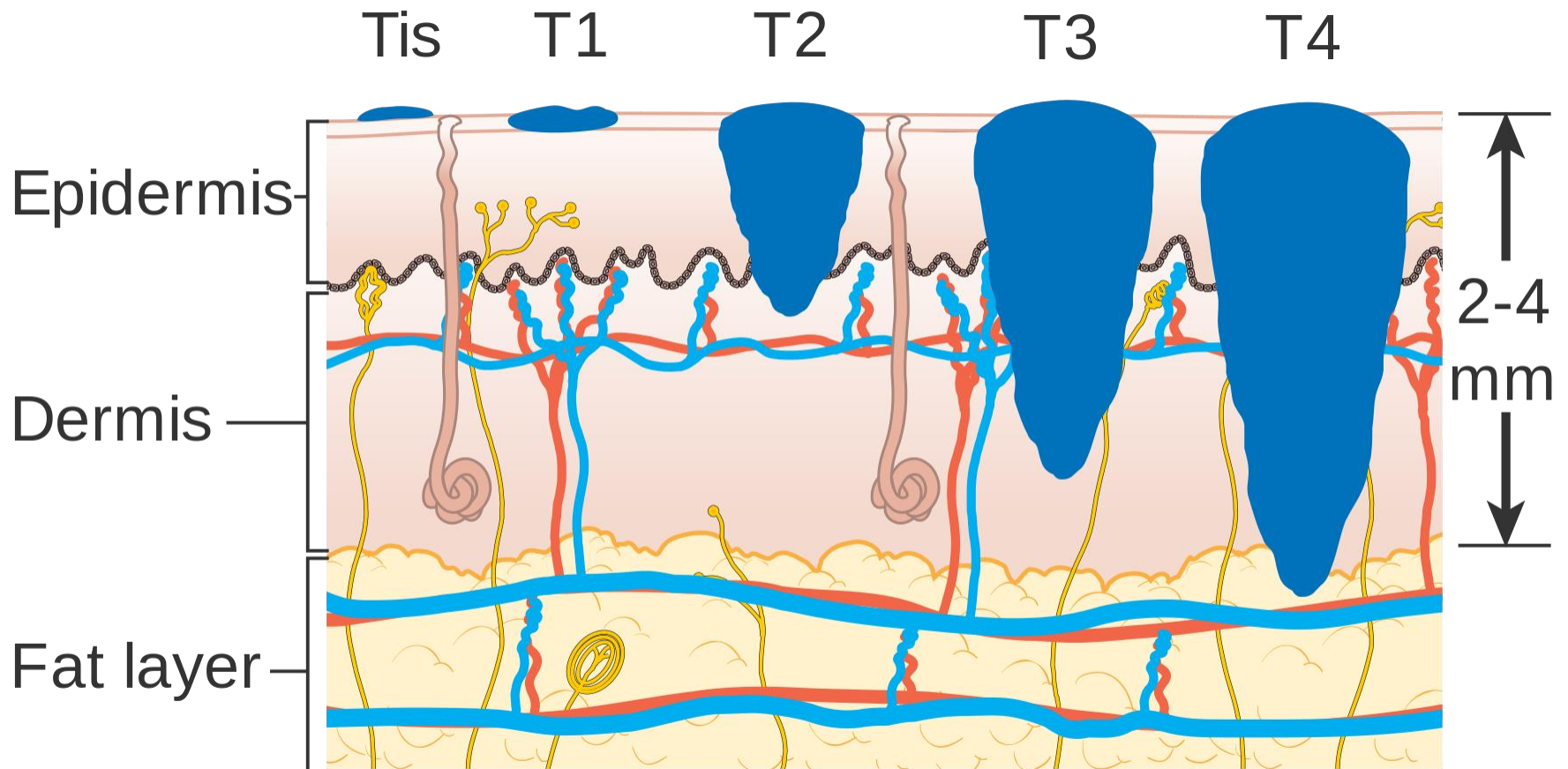
- Nevus
  - Melanocytic nevi are benign neoplasms of melanocytes and appear in a myriad of variants.
  - In contrast to melanoma they are usually symmetric with regard to the distribution of color and structure.
- Melanoma
  - Melanoma is a malignant neoplasm derived from melanocytes that may appear in different variants.
  - If excised in an early stage it can be cured by simple surgical excision. Melanomas can be invasive or noninvasive.

# Site of Melanoma



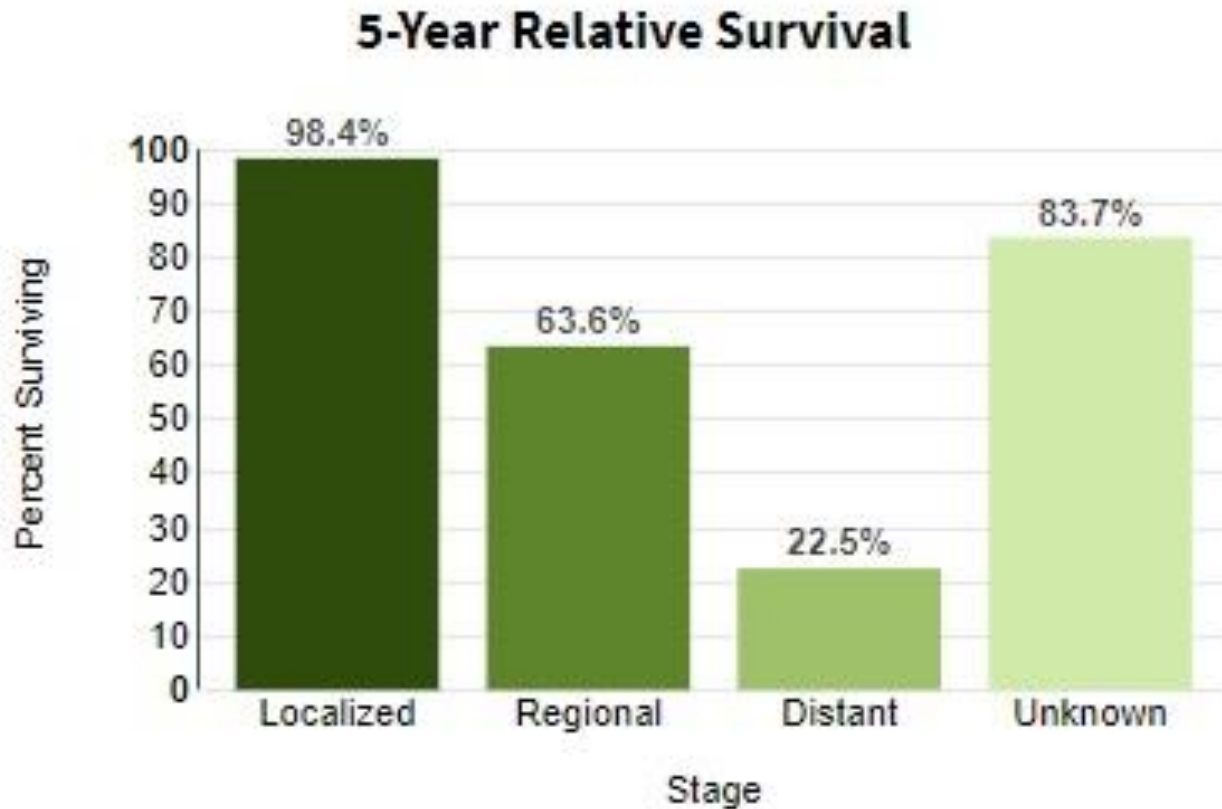
[https://en.wikipedia.org/wiki/Melanoma#/media/File:Diagram\\_showing\\_where\\_melanoma\\_is\\_most\\_likely\\_to\\_develop\\_CRUK\\_383.svg](https://en.wikipedia.org/wiki/Melanoma#/media/File:Diagram_showing_where_melanoma_is_most_likely_to_develop_CRUK_383.svg)

# Progression of Melanoma



[https://en.wikipedia.org/wiki/Melanoma#/media/File:Diagram\\_showing\\_the\\_T\\_stages\\_of\\_melanoma\\_CRUK\\_373.svg](https://en.wikipedia.org/wiki/Melanoma#/media/File:Diagram_showing_the_T_stages_of_melanoma_CRUK_373.svg)

# Survival Rate of Melanoma



<https://upload.wikimedia.org/wikipedia/commons/e/ed/5YearSurvival2008to14.jpg>



# Your Tasks

- Deliver a deep learning model to differentiating melanoma from benign nevus.
- A testing dataset will be released a week before case presentation 2 to evaluate the trained model.
- Give a presentation on 6/18 class